Deep Blue
This remarkable blend contains oils that are well known and are frequently studied for their abilities to soothe inflammation, alleviate pain, and reduce soreness.

Oils Contained in this blend

Wintergreen
Contains 99% methyl salicylate, which gives it cortisone-like properties. It can be beneficial for arthritis, rheumatism, tendinitis, and any other discomfort that is related to the inflammation of bones, muscles, and joints.

Camphor
Is analgesic (pain-relieving) and anti-inflammatory. It may be beneficial for arthritis, rheumatism, muscle aches and pains, sprains, and bruises.

Peppermint
Is anti-inflammatory to the prostate and to damaged tissues, it has a soothing and cooling effect that may help with arthritis and inflammation.

Blue Tansy
Is analgesic and anti-inflammatory. It may also help with low blood pressure, arthritis, and rheumatism.

German Chamomile
Is antioxidant, anti-inflammatory, and analgesic. It may also help relieve congestion and arthritis.

Helichrysum
May help cleanse the blood and improve circulatory functions. It is anticatarrhal in structure and nature. As a powerful anti-inflammatory it may even help reduce inflammation in the ménages of the brain.

Osmanthus
Is one of the 10 famous traditional flowers of China. The blossoms are highly aromatic and are used in the world’s rarest and most expensive perfumes. It is used in Chinese medicine to reduce phlegm and remove blood stasis.

Deep Blue common primary uses
Arthritis, back pain, bone pain, bruises, bursitis, fibromyalgia, inflammation, joint pain, muscle aches/pain, muscle tension, pain, tension headaches, whiplash

Body Systems affected
The oils in this blend may help it be effective for dealing with various problems related to the nervous system and to muscles and bones.

Applications
Apply as a compress on spine and on reflex points on the feet. Apply on location for muscle cramps, bruises, or any other pain.
**Safety data**
Use with caution during pregnancy

**Companion oil**
Add Frankincense to enhance or wintergreen for bone pain

**DEEP BLUE:**

**Blue Chamomile**

**Anti-nociceptive and anti-inflammatory activities of (-)-α-bisabolol in rodents.**
Rocha NF1, Rios ER, Carvalho AM, Cerqueira GS, Lopes Ade A, Leal LK, Dias ML, de Sousa DP, de Sousa FC.

Author information

Abstract

(-)-α-Bisabolol is an unsaturated, optically active sesquiterpene alcohol obtained by the direct distillation of essential oil from plants such as Vanillosmopsis erythropappa and Matricaria chamomilla. (-)-α-Bisabolol has generated considerable economic interest, as it possesses a delicate floral odour and has been shown to have antiseptic and gastroprotective activities. In this study, (-)-α-bisabolol was tested in standardised rodent models by gavage administration at doses of 100 and 200 mg/kg in the models of inflammation and 25 and 50 mg/kg in the models of nociception. In the inflammatory models of paw oedema induced by carrageenan and dextran, the mice treated with (-)-α-bisabolol showed smaller oedemas compared to animals treated only with the vehicle. (-)-α-Bisabolol was capable of reducing paw oedemas induced by 5-HT but not oedemas induced by histamine. (-)-α-Bisabolol demonstrated anti-nociceptive activity in the models of visceral nociception induced by acetic acid and in the second phase of the nociception test induced by the intraplantar administration of formalin. (-)-α-Bisabolol did not have any effect in a thermal nociception model using a hot plate but was able to diminish mechanical inflammatory hypernociception evoked by carrageenan. These findings suggest that the anti-nociceptive action of (-)-α-bisabolol is not linked to a central mechanism but instead is related to the inflammatory process. (-)-α-Bisabolol was able to decrease leukocyte migration, protein extravasations and the amount of TNF-α to the peritoneal cavity in response to carrageenan. Additionally, (-)-α-bisabolol reduced neutrophil degranulation in response to phorbol-myristate-acetate. We demonstrate, for the first time, the peripheral anti-inflammatory and anti-nociceptive activities of (-)-α-bisabolol.

PMID: 21870032 [PubMed - indexed for MEDLINE]
Blue tansy (Moroccan tansy)

A Review of the Therapeutic Properties of Blue Tansy

Within the botanical family Asteracease are many varieties of chamomile, a diverse group of plants that have a rich history of usage protocols for various health applications. Many species of chamomile exist from several subclasses within the Asteracease family, but 3 varieties in particular have been recognized for their functional diversity and the powerful range of health benefits they confer. Roman chamomile (Anthemis nobilis), German chamomile (Matricaria recutita), and true Moroccan chamomile (Tanacetum annuum) comprise the three groups of therapeutic chamomiles that are also used for essential oil production. Each variety of chamomile oil possesses a unique chemical profile distinguishing it from all other varieties. Despite their differences, the chamomiles are close relatives that have many constituents in common and similarities in appearance.

As the scientific understanding of both the individual aromatic constituents and the synergistic effects of the oil’s entire chemical profile continues to expand, the traditional usages of chamomile are being validated. Moroccan chamomile (more commonly referred to as Blue Tansy) has been less widely studied than other chamomiles; however, emerging research continues to demonstrate its especially potent and relevant applications to health management in both personal and medicinal settings.

True Moroccan chamomile is part of the Tanacetum subclass within the Asteracease family that itself is composed of between 150 and 200 plant species. Distinguishable by its deep indigo hue, blue tansy has a characteristically high proportion of chamzulene, the volatile aromatic compound responsible for this brilliant coloration. Apart from chamzulene, Moroccan chamomile also has high levels of camphor and sabinene. The compositional prevalence of terpene and oxygenated terpene compounds makes blue tansy an especially effective antioxidant contributor as well as a powerful anti-inflammatory agent.

Like many essential oils, Blue Tansy has been shown to have powerful antioxidant properties. The body is constantly exposed to free radicals from harsh environmental conditions (pollution, smoke, or UV radiation from the sun), the diet, and as natural byproducts of the metabolic reactions occurring constantly in every cell of the body. Regardless of origin, all reactive molecules have damaging effects on the cells and tissues of the body, which in turn induce inflammatory responses, and over time can lead to chronic disease. Exposure to
reactive oxidative species is seemingly unavoidable, but the damaging effects can be offset by consuming a diet rich in antioxidants. Antioxidants donate the electrons needed to impede cellular oxidation and prevent damaging chain reactions from destroying cellular membranes.

Emerging research has pinpointed many essential oils for their antioxidant properties, including Blue Tansy oil. For example, one study assayed 248 essential oils across 18 botanical families for their antioxidant activity at varying concentrations using a DPPH assay. Sixty oils were found to reduce the activity of free radicals by 90% or more. Within the Asteraceae family alone, 6 essential oils were assayed and shown to inhibit over 90% of free radical activity at a concentration of 100mg/ml. Blue Tansy was the only species from this family able to reduce antioxidant activity at a concentration of only 5mg/ml; thus demonstrating its effectiveness as a free radical scavenger.

Coupled with antioxidant properties, Blue Tansy oil has been widely used in personal health care management as an anti-inflammatory agent. Many medical professionals have integrated the use of chamomile extracts (such as herbal teas) and oils (including those from Blue Tansy) to aid in reduction of the pain and inflammation severity in arthritic conditions and inflammatory bowel disease. The benefits of this oil extend far beyond just severe inflammatory conditions to milder scenarios such as the common cold, strep throat, flus, and even gingivitis. The foundational basis for validating the claim that Blue Tansy oil has significant anti-inflammatory properties is derived mainly from in vitro studies. Many physiologic pathways have been investigated, particularly those involving chamzulene, a constituent that has been singled out for its powerful anti-inflammatory properties.

For example, chamzulene has been shown to reduce membrane inflammation from heavy metal oxidation, inhibit the cyclooxygenase (COX-2) pathway (similar to anti-inflammatory action exhibited by steroid treatments), and prevent action of enzymes central to arachadonic acid cascade. More clinical research is needed to more fully understand how in vitro research translates to the intricacies of human physiology and to further legitimize the use of blue tansy as an anti-inflammatory mediator. However, the current research should not be disregarded as it provides a sound foundational basis for future research that foreshadows promising results.

Another exciting field of research is the study of essential oils for their anticancerous properties. The anti-proliferative properties of Blue Tansy essential oil is in the process of being meticulously investigated through in vitro studies. Current research indicates that essential oil derived from blue tansy exhibits anticancer activity through inhibition of DNA biosynthesis, apoptosis of progenitor cells, and induction of cytotoxicity of active cancer cells. Many of the agents used in chemotherapy have a natural basis, so continuing to evaluate the efficacy of natural plant extracts has profound implications in treating cancer. Researchers
have speculated that Blue Tansy’s high content of sabinene may contribute to its anti-cancer properties because this constituent is also found in other essential oils shown to be anti-cancerous. Additionally, this oil has a high proportion of 1,8-cineole and camphor, oxygenated monoterpenes clinically demonstrated to exhibit anti-tumor properties.

Blue Tansy, although widely revered for its dynamic health applications, has been underappreciated in the medicinal world because research about this oil and its constituents is just emerging. However, its therapeutic properties demonstrated through in vitro experimentation, anecdotal usage, and even on a limited basis in the medical setting has merited this oil as one with many beneficial properties that should be subject to more rigorous and widespread usage and testing.

References


Helichrysum

Arzanol, an anti-inflammatory and anti-HIV-1 phloroglucinol alpha-Pyrone from Helichrysum italicum ssp. microphyllum.

Appendino G¹, Ottino M, Marquez N, Bianchi F, Giana A, Ballero M, Sterner O, Fiebich BL, Munoz E.

Author information

Abstract

An acetone extract of Helichrysum italicum ssp. microphyllum afforded the phloroglucinol alpha-pyrene arzanol (1a) as a potent NF-kappaB inhibitor. Arzanol is identical with homoarenol (2a), whose structure should be revised.
The phloroglucinol-type structure of arzanol and the 1,2,4-trihydroxyphenyl-type structure of the base-induced fragmentation product of homoarenol could be reconciled in light of a retro-Fries-type fragmentation that triggers a change of the hydroxylation pattern of the aromatic moiety. On the basis of these findings, the structure of arenol, the major constituent of the clinically useful antibiotic arenarin, should be revised from 2b to 1b, solving a long-standing puzzle over its biogenetic derivation. An alpha-pyrone (micropyrone, 7), the monoterpene rac-E-omega-oleoyloxylinalol (10), four known tremetones (9a-d), and the dimeric pyrone helipyrone (8) were also obtained. Arzanol inhibited HIV-1 replication in T cells and the release of pro-inflammatory cytokines in LPS-stimulated primary monocytes, qualifying as a novel plant-derived anti-inflammatory and antiviral chemotype worth further investigation.

Osmanthus

Antioxidant activity and melanogenesis inhibitory effect of the acetonic extract of Osmanthus fragrans

Abstract

Osmanthus fragrans, a common flavor additive for tea and other beverages, has potential applications in biomedical science. In this study, we investigated O. fragrans acetonic extract (OFE) for its total phenolic and flavonoid contents, radical-scavenging activity, and potential anti-tyrosinase ability. OFE possessed considerable amounts of phenolics (264.7 mg gallic acid equivalent/g of extract) and flavonoids (190.7 mg catechin equivalent/g of extract). The antioxidation activities, measured in terms of EC_{50} values using DPPH and ABTS^{+} assays, were 304.9 mg ascorbic acid equivalent/g of extract and 516.3 mg trolox equivalent/g of extract, respectively. LC–MS results discovered the presence of luteolin in the extract, and a kinetic study revealed an uncompetitive inhibitory effect of OFE upon the oxidation of tyrosine (IC_{50} = 2.314 mg/mL) and L-DOPA (IC_{50} = 44.20 mg/mL). In addition, we tested OFE in vitro (B16F10 cells) for its anti-tyrosinase activity and anti-melanin formation and found that OFE was able to reduce the tyrosinase activity and melanin formation of B16F10 cells in a dose-dependent manner. Our findings support that O. fragrans is a potential natural, functional antioxidant food favor additive. Additionally, because OFE inhibits melanin formation, it appears to have potential use as an anti-browning food additive, in skin-whitening cosmetics, or as a new drug for treating melanoma.

Abbreviations

GAE, Gallic acid equivalent; TEAC, Trolox equivalent, antioxidant capacity; CHD, Coronary heart disease; MTT, 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide
Peppermint

A Prospective Randomized Study of the Effectiveness of Aromatherapy for Relief of Postoperative Nausea and Vomiting

Nancy S. Hodge, RN, MSN, BSN, ACNS-BC email address, Mary S. McCarthy, RN, PhD, MN, BSN, Roslyn M. Pierce, BA

Introduction
Postoperative nausea and vomiting (PONV) is a major concern for patients having surgery under general anesthesia as it causes subjective distress along with increased complications and delays in discharge from the hospital. Aromatherapy represents a complementary and alternative therapy for the management of PONV.

Purpose
The objective of this study was to compare the effectiveness of aromatherapy (QueaseEase, Soothing Scents, Inc, Enterprise, AL) versus an unscented inhalant in relieving PONV.

Methods
One hundred twenty-one patients with postoperative nausea were randomized into a treatment group receiving an aromatic inhaler and a control group receiving a placebo inhaler to evaluate the effectiveness of aromatherapy.

Findings
Initial and follow-up nausea assessment scores in both treatment and placebo groups decreased significantly (P < .01), and there was a significant difference between the two groups (P = .03). Perceived effectiveness of aromatherapy was significantly higher in the treatment group (P < .001).
Conclusions
Aromatherapy was favorably received by most patients and represents an effective treatment option for postoperative nausea.

The effects of peppermint on exercise performance

Enhancing athletic performance is a great desire among the athletes, coaches and researchers. Mint is one of the most famous natural herbs used for its analgesic, anti-inflammatory, antispasmodic, antioxidant, and vasoconstrictor effects. Even though inhaling mint aroma in athletes has been investigated, there were no significant effects on the exercise performance.

METHODS: Twelve healthy male students every day consumed one 500 ml bottle of mineral water, containing 0.05 ml peppermint essential oil for ten days. Blood pressure, heart rate, and spirometry parameters including forced vital capacity (FVC), peak expiratory flow rate (PEF), and peak inspiratory flow (PIF) were determined one day before, and after the supplementation period. Participants underwent a treadmill-based exercise test with metabolic gas analysis and ventilation measurement using the Bruce protocol.

RESULTS: The FVC (4.57 ± 0.90 vs. 4.79 ± 0.84; p < 0.001), PEF (8.50 ± 0.94 vs. 8.87 ± 0.92; p < 0.01), and PIF (5.71 ± 1.16 vs. 6.58 ± 1.08; p < 0.005) significantly changed after ten days of supplementation. Exercise performance evaluated by time to exhaustion (664.5 ± 114.2 vs. 830.2 ± 129.8 s), work (78.34 ± 32.84 vs. 118.7 ± 47.38 KJ), and power (114.3 ± 24.24 vs. 139.4 ± 27.80 KW) significantly increased (p < 0.001). In addition, the results of respiratory gas analysis exhibited significant differences in VO2 (2.74 ± 0.40 vs. 3.03 ± 0.351 L/min; p < 0.001), and VCO2 (3.08 ± 0.47 vs. 3.73 ± 0.518 L/min; p < 0.001).

CONCLUSIONS: The results of the experiment support the effectiveness of peppermint essential oil on the exercise performance, gas analysis, spirometry parameters, blood pressure, and respiratory rate in the young male students. Relaxation of bronchial smooth muscles, increase in the ventilation and brain oxygen concentration, and decrease in the blood lactate level are the most plausible explanations.

THE EFFECTS OF PEPPERMINT ON EXERCISE PERFORMANCE.

**Antispasmodic effect of Mentha piperita essential oil on tracheal smooth muscle of rats**

Mentha piperita is a plant popularly known in Brazil as “hortelã-pimenta” whose essential oil is used in folk medicine for its anti-inflammatory, antispasmodic, expectorant actions and anti-congestive. Here, it was investigated the effect of Mentha piperita essential oil (peppermint oil) in rat tracheal rings along with its mechanism of action.

**MATERIALS AND METHODS:** Tracheal tissue from male Wistar rats (250-300 g) were used. Peppermint oil was added in cumulative concentrations [1-300 microg/ml] to the tissue basal tonus or pre-contracted by carbachol [10 microM] at 10 min intervals, incubated or not with indomethacin [10 microM], L-N-methyl-nitro-arginine [100 microM], hexamethonium [500 microM], or tetraethylammonium [5 mM].

**RESULTS:** Peppermint oil [100 and 300 microg/ml] inhibited the contractions induced by carbachol, which was reversed by indomethacin, L-N-methyl-nitro-arginine and hexamethonium, but not by tetraethylammonium. These data suggest the participation of prostaglandin E(2), nitric oxide and autonomic ganglions in the peppermint oil relaxant effect and may be correlated with its popular use in respiratory diseases.

**CONCLUSIONS:** Peppermint oil exhibited antispasmodic activity on rat trachea involving prostaglandins and nitric oxide synthase.

**Peppermint oil in the treatment of irritable bowel syndrome**

**INTRODUCTION:** The use of peppermint oil in treating the irritable bowel syndrome has been studied with variable results probably due to the presence of patients affected by small intestinal bacterial overgrowth, lactose intolerance or celiac disease that may have symptoms similar to irritable bowel syndrome.

**AIM:** The aim of the study was to test the effectiveness of enteric-coated peppermint oil in patients with irritable bowel syndrome in whom small intestinal bacterial overgrowth, lactose intolerance and celiac disease were excluded.
METHODS: Fifty-seven patients with irritable bowel syndrome according to the Rome II criteria, with normal lactose and lactulose breath tests and negative antibody screening for celiac disease, were treated with peppermint oil (two enteric-coated capsules twice per day or placebo) for 4 weeks in a double blind study. The symptoms were assessed before therapy (T(0)), after the first 4 weeks of therapy (T(4)) and 4 weeks after the end of therapy (T(8)). The symptoms evaluated were: abdominal bloating, abdominal pain or discomfort, diarrhoea, constipation, feeling of incomplete evacuation, pain at defecation, passage of gas or mucus and urgency at defecation. For each symptom intensity and frequency from 0 to 4 were scored. The total irritable bowel syndrome symptoms score was also calculated as the mean value of the sum of the average of the intensity and frequency scores of each symptom.

RESULTS: At T(4), 75% of the patients in the peppermint oil group showed a >50% reduction of basal (T(0)) total irritable bowel syndrome symptoms score compared with 38% in the placebo group (P<0.009). With peppermint oil at T(4) and at T(8) compared with T(0) a statistically significant reduction of the total irritable bowel syndrome symptoms score was found (T(0): 2.19 +/- 0.13, T(4): 1.07 +/- 0.10*, T(8): 1.60 +/- 0.10*, *P<0.01 compared with T(0), mean +/- S.E.M.), while no change was found with the placebo.

CONCLUSION: A 4 weeks treatment with peppermint oil improves abdominal symptoms in patients with irritable bowel syndrome.

PEPPERMINT OIL (MINTOIL) IN THE TREATMENT OF IRRITABLE BOWEL SYNDROME: A PROSPECTIVE DOUBLE BLIND PLACEBO-CONTROLLED RANDOMIZED TRIAL.


**Wintergreen**

Comparison of oral aspirin versus topical applied methyl salicylate for platelet inhibition

BACKGROUND: Oral acetylsalicylic acid (aspirin) is the primary antiplatelet therapy in the treatment of acute myocardial infarction and acute coronary syndrome. Methyl salicylate (MS; oil of wintergreen) is compounded into many over-the-counter antiinflammatory muscle preparations and has been shown to inhibit platelet aggregation locally and to be absorbed systemically.
OBJECTIVE: To assess the ability of topically applied MS to inhibit systemic platelet aggregation for patients who are unable to tolerate oral drug therapy.

METHODS: A randomized, prospective, blinded, crossover study was conducted in 9 healthy men, aged 30-46 years. All subjects ingested 162 mg of aspirin or applied 5 g of 30% MS preparation to their anterior thighs. There was a minimum 2-week washout period between study arms. Blood and urine were collected at baseline and at 6 hours. An aggregometer measured platelet aggregation over time against 5 standard concentrations of epinephrine, and a mean area under the curve (AUC) was calculated. Urinary metabolites of thromboxane B(2) were measured by a standard enzyme immunoassay. Differences in and between groups at baseline and 6 hours were tested by the Wilcoxon signed-rank test.

RESULTS: Baseline platelet aggregation did not differ significantly between the 2 arms of the study (median AUC [% aggregation(*)min]; binominal confidence intervals): aspirin 183; 139 to 292 versus MS 197; 118 to 445 (p = 0.51). Both aspirin and MS produced statistically significant platelet inhibition; aspirin decreased the AUC from 183; 139 to 292 to 85; 48 to 128 (p = 0.008) and MS decreased the AUC from 197; 118 to 445 to 112; 88 to 306 (p = 0.011). No significant difference was detected between baseline and 6-hour thromboxane levels for either aspirin (p = 0.779) or MS (p = 0.327).

CONCLUSIONS: Topical MS and oral aspirin both significantly decrease platelet aggregation in healthy human volunteers. Comparison of oral aspirin versus topical applied methyl salicylate for platelet inhibition.


Chronic Pain-

**Frankincense**

Has been studies for its anti-inflammatory and anti-infectious properties. Frankincense is also soothing to the skin and nerves.

**Chemical Constituents**

Monoterpenes(Up to 90%): α-&amp;β-pinenes(43% ) α-thujene(<22%), l-limonene (<16%), myrcene (<12%),sabinene(<7%), p-cymene (<5%), α-terpinene, camphene, a-phellandrene: Sesquiterpenes (<10%), B-caryophyllene(<8%), a-gurjunene, a-guine: Alcohols (<5%): incensol, borneol, obilianol, trans-pinocarveol, farnesol.

**Properties**

Anticitarrhal, anticancer, antidepressant, anti-infectious, anti inflammatory, antiseptic, antitumor, expectorant, immune stimulant, and sedative.
Common Primary Uses
Alzheimer’s Disease, aneurysm, Arthritis, asthma, balance, brain(aging), brain injury, breathing, cancer, coma concussion, confusion, coughs, depression, fibroids, genital warts, hepatitis, Immune System support improve vision, infected wounds, inflammation, liver cirrhosis, lou gehrig’s disease, plague, postpartum depression, scarring(Prevention), memory, mental fatigue, miscarriage(after), moles, MRSA, Multiple sclerosis, Nasal polyp, Parkinson’s Disease, tumor (lipoma), ulcers, uterus tissue regeneration, virus of nerves, warts, wrinkles

Body systems affected
Emotional balance, immune and nervous systems, skin

Aromatic Influence
This oil helps to focus energy minimize distractions, and improve concentration, It eases hyperactivity, impatience, irritability, and restlessness and can help enhance spiritual awareness and meditation

Marijam
Properties
Antibacterial, anti-infectious, antiseptic, anti-sexual, antispasmodic, arterial vasodilator, digestive stimulant, diuretic, expectorant, sedative, and tonic

Common Primary uses
Arterial vasodilator, arthritis, bone spurs, carpal tunnel syndrome, cartilage injury, colic, constipation, craps/charley horses, croup, expectorant, high blood pressure, muscle aches, muscle fatigue, muscle spasms, muscle tone, muscular dystrophy, neuralgia, osteoarthritis, pancreatitis, Parkinson’s disease, physical stress, prolapsed mitral valve, rheumatoid arthritis, sprains, stiffness, tendinitis tension(muscle), whiplash(muscles)

Historical uses
Marijam was used to combat poisoning, fluid retention muscle spasms, rheumatism, sprains, stiff joints, bruises, obstructions of their liver and spleen, and respiratory congestions,

Other possible uses
It may be relaxing and calming to the muscles that constrict and sometimes contribute to headaches,. It may help anxiety, boils, bruises, burns, carbuncles, celibacy (, colds, cold sores, cuts, fungus and viral infections, hysteria, menstrual problems, calm the respiratory system, ringworm, shingles, shock, sores, relieve spasms, sunburns, and water retention

Body systems affected
Cardiovascular system, muscles and bones
Aromatic influences It promotes peace and sleep

Application
Can be applied neat (With no dilution) when used topically. Apply to reflex points and directly on area of concern: diffuse

Lemongrass
Properties
Analgesic, antibacterial, anticancer, anti-inflammatory antiseptic, insect repellent, revitalize, sedative, tonic, and vasodilator

**Historical uses**

Lemongrass has been used for infectious illnesses and fever, as an insecticide, as insecticide, and as a sedative to the central nervous system.

**Other possible uses**

This oil may help with the circulation, improving digestion, improving eyesight, fevers, flatulence, headaches, clearing infections, repairing ligaments, walking up the lymphatic system, getting the oxygen flowing, respiratory problems, sore throats, tissues regeneration, and water retention

**Body Systems**

Immune system, muscles and bones

**Application**

Can be applied neat (with no dilution), or dilute 1:1 (1 drop essential oil to 1 drop carrier oil) for children and for those with sensitive skin when using topically apply to reflex points or directly on area of concern

---

**Helichrysum**

**Properties**

Antibacterial, anticitratrhal, anticoagulant, antioxidant, antispasmodic, antiviral, expectorant, and mucolytic

**Common Primary Uses**

Abcess (tooth) Aids/HIV Aneurysm, bleeding, bone bruise, broken blood vessels, bruises, catarrh, cholesterol, cleansing, colitis, cuts, dermatitis/eczema, detoxification, earache, fibroids, gallbladder infection, hematoma, hemorrhaging herpes simplex incision hernia, liver stimulant, lymphatic drainage, nose bleed, pancreas stimulant, phlebitis, psoriasis, sciatica, shock, Staph infection, stroke, sunscreen, swollen eyes, taste (impaired), tennis elbow, tinnitus, tissue pain, tissue repair, vertigo, viral infections, wounds

**Historical Uses**

Helichrysum has been used for asthma, bronchitis, whooping cough, headaches, liver ailments, and ski disorders.

**Other possible uses**

This oil may help with anger management, bleeding, circulatory functions, hearing, detoxifying and stimulating the liver cell function, pain (acute), relieve respiratory conditions, reduce scarring, scar tissue, regenerate tissue, and varicose veins.

**Aromatic Influence**

It is uplifting to the subconscious and may help calm feelings of anger

---

**Basil**

**Properties**

Antibacterial, anti-infectious, anti-inflammatory, antioxidant, antispasmodic (powerful), antiviral, decongestant (veins, arteries of the lungs, prostate), diuretic, disinfectant (urinary/pulmonary), stimulant (nerve, adrenal cortex), and uplifting.

Basil is also anticatrarrhal, antidepressant, energizing, and restorative
Common Primary Uses
Amenorrhea, autism, bee/hornet stings, bites/stings, bronchitis, bursitis, carpal tunnel syndrome, chronic fatigue, cramps (abdominal) cuts, earache, frozen shoulder, greasy/oily hair healing hiatus hernia incisional hernia, induce sweating, infertility, lactation(increase milk production) mental fatigue, migraines, mouth ulcers, muscle spasms, muscular dystrophy, olfactory loss (sense of smell) ovarian cyst, Schmidt’s syndrome, snake bites, spider bites, transition (labor), viral hepatitis, wounds

Historical uses
Basil was used anciently for respiratory problems, digestive and kidney ailments, epilepsy, poisonous insect or snake bites, fivers, epidemics, and malaria

Other possible uses
This oil may be used for alertness, anxiety, chills, chronic colds, concentration, nervous depression, digestion, fainting, headaches, hiccups, insect bites, (soothing), insect repellent, insomnia (from nervous tension), intestinal problems, rhinitis (inflammation of nasal mucus membranes), vomiting, wasp stings, and whooping cough

Body systems affected
Cardiovascular system, muscles and bones.

Frankincense:

Boswellia frereana suppresses cytokine-induced matrix metalloproteinase expression and production of pro-inflammatory molecules in articular cartilage

The aim of this study was to assess the anti-inflammatory efficacy of Boswellia frereana extracts in an in vitro model of cartilage degeneration and determine its potential as a therapy for treating osteoarthritis. Cartilage degradation was induced in vitro by treating explants with 5 ng/ml interleukin1alpha (IL-1alpha) and 10 ng/ml oncostatin M (OSM) over a 28-day period, in the presence or absence of 100 microg/ml B. frereana. Treatment of IL-1alpha/OSM stimulated cartilage explants with B. frereana inhibited the breakdown of the collagenous matrix. B. frereana reduced MMP9 and MMP13 mRNA levels, inhibited MMP9 expression and activation, and significantly reduced the production of nitrite (stable end product of nitric oxide), prostaglandin E2 and cyclooxygenase-2. Epilupeol was identified as the principal constituent of B. frereana. This is the first report on the novel anti-inflammatory properties of Boswellia frereana in an in vitro model of cartilage degradation. We have demonstrated that B. frereana prevents collagen degradation, and inhibits the production of pro-inflammatory mediators and MMPs. Due to its efficacy we propose that B. frereana should be examined further as a potential therapeutic agent for treating inflammatory symptoms associated with arthritis.
BOSWELLIA FREREANA (FRANKINCENSE) SUPPRESSES CYTOKINE-INDUCED MATRIX METALLOPROTEINASE EXPRESSION AND PRODUCTION OF PRO-INFLAMMATORY MOLECULES IN ARTICULAR CARTILAGE.

Phytother Res. 2010 Jun;24(6):905-12. doi: 10.1002/ptr.3055. Blain EJ, Ali AY, Duance VC. Connective Tissue Biology Laboratories, School of Biosciences, Cardiff University, Cardiff, UK. blain@cardiff.ac.uk

Chemistry and immunomodulatory activity of frankincense oil

The yield of steam distillation of frankincense essential oil (3%); and its physicochemical constants were determined. Capillary GC/MS technique was used for the analysis of the oil. Several oil components were identified based upon comparison of their mass spectral data with those of reference compounds published in literature or stored in a computer library. The oil was found to contain monoterpenes (13.1%), sesquiterpenes (1%), and diterpenes (42.5%). The major components of the oil were duva-3,9,13-trien-1,5alpha-diol-1-acetate (21.4%), octyl acetate (13.4%), o-methyl anisole (7.6%), naphthalene decahydro-1,1,4a-trien-6-methylene-5-(3-methyl-2-pentenyl) (5.7%), thunbergol (4.1%), phenanthrene-7-ethenyl-1,2,3,4,4a,5,6,7,8,9,10,10a-dodecahydro-1,1,4a,7-tetramethyl (4.1%), alpha-pinene (3.1%), sclarene (2.9%), 9-cis-retinal (2.8%), octyl formate (1.4%), verticiol (1.2%) decyl acetate (1.2%), n-octanol (1.1%). The chemical profile of the oil is considered as a chemotaxonomical marker that confirmed the botanical and geographical source of the resin. Biologically, the oil exhibited a strong immunostimulant activity (90% lymphocyte transformation) when assessed by a lymphocyte proliferation assay.

Z Naturforsch C. 2003 Mar-Apr;58(3-4):230-8. Mikhaeil BR, Maatooq GT, Badria FA, Amer MM. Department of Pharmacognosy, Faculty of Pharmacy, Mansoura University, Mansoura 35516, Egypt. botros113426@yahoo.com

Composition and potential anticancer activities of essential oils obtained from myrrh and frankincense

The present study aimed to investigate the composition and potential anticancer activities of essential oils obtained from two species, myrrh and frankincense, by hydrodistillation. Using gas chromatography-mass spectrometry (GC-MS), 76 and 99 components were identified in the myrrh and frankincense essential oils, respectively, with the most abundant components, 2-Cyclohexen-1-one, 4-ethynyl-4-hydroxy-3,5,5-trimethyl- and n-Octylacetate, accounting for 12.01 and 34.66%, respectively. The effects of the two essential oils, independently and as a mixture, on five tumor cell lines, MCF-7, HS-1, HepG2, HeLa and A549, were investigated using the MTT assay. The results indicated that the MCF-7 and HS-
1 cell lines showed increased sensitivity to the myrrh and frankincense essential oils compared with the remaining cell lines. In addition, the anticancer effects of myrrh were markedly increased compared with those of frankincense, however, no significant synergistic effects were identified. The flow cytometry results indicated that apoptosis may be a major contributor to the biological efficacy of MCF-7 cells.

COMPOSITION AND POTENTIAL ANTICANCER ACTIVITIES OF ESSENTIAL OILS OBTAINED FROM MYRRH AND FRANKINCENSE.


Marjoram

Antimutagenic Effect of Origanum majorana L. Essential Oil

This study aimed to investigate the genotoxic and cytotoxic potential of prallethrin in rat bone marrow cells and the protective effect of Origanum majorana L. essential oil (EO). Our results demonstrated that prallethrin at dose 64.0 mg/kg body weight (b.wt.), (1/10 LD50) has a clastogenic/genotoxic potential as shown by the high percentage of chromosomal aberration (CA) and micronucleus (MN) in the bone marrow cells of male rats, whereas the combined treatment of prallethrin and O. majorana EO resulted in the reduction of the CA (54.54%). The combined treatment also reduced the micronuclei formation significantly. In conclusion, prallethrin can be considered clastogenic/genotoxic and may carry a risk to human health. The study revealed the antigenotoxic and anticytotoxic potential of O. majorana EO against prallethrin-induced genotoxic and cytotoxic effects in rat bone marrow cells.

ANTIMUTAGENIC EFFECT OF ORIGANUM MAJORANA L. ESSENTIAL OIL AGAINST PRALLETHRIN-INDUCED GENOTOXIC DAMAGE IN RAT BONE MARROW CELLS.


Total phenolic content, radical scavenging properties, and essential oil composition of Origanum species
The aim of this work was to compare the antiradical activity, total phenol content (TPC), and essential oil composition of Origanum vulgare spp. virens, Origanum x apllii, Origanum x majoricum, and O. vulgare spp. vulgare cultivated in Argentina in different localities. The experiment was conducted in the research station of La Consulta (INTA-Mendoza), the research station of Santa Lucia (INTA-San Juan), and Agronomy Faculty of National University of La Pampa, from 2007 to 2008. The composition of the essential oils of oregano populations was independent of cultivation conditions. In total, 39 compounds were identified in essential oils of oregano from Argentina by means of GC-MS. Thymol and trans-sabinene hydrate were the most prominent compounds, followed by gamma-terpinene, terpinen-4-ol, and alpha-terpinene. O. vulgare vulgare is the only Origanum studied which is rich in gamma-terpinene. Among tested oregano, O. x majoricum showed the highest essential oil content, 3.9 mg g(-1) dry matter. The plant extract of O. x majoricum had greater total phenol content values, 19.36 mg/g dry weight, than the rest of oregano studied. To find relationships among TPC, free radical scavenging activity (FRSA), and climate variables, canonical correlations were calculated. The results obtained allow us to conclude that 70% of the TPC and FRSA variability can be explained by the climate variables (R(2) = 0.70; p = 8.3 x 10(-6)), the temperature being the most important climatic variable.

TOTAL PHENOLIC CONTENT, RADICAL SCAVENGING PROPERTIES, AND ESSENTIAL OIL COMPOSITION OF ORIGANUM SPECIES FROM DIFFERENT POPULATIONS.


**Lemongrass**

**Phytochemical composition of Cymbopogon citratus and Eucalyptus citriodora essential oils and their anti-inflammatory and analgesic properties**

Cymbopogon citratus and Eucalyptus citriodora are widely used herbs/plants as a source of ethnomedicines in tropical regions of the world. In this work, we studied the anti-inflammatory and gastroprotective effects of C. citratus and E. citriodora essential oils on formol-induced edema, and acetic acid induced abdominal cramps in Wistar rats. To fully understand the chemically induced anti-inflammatory properties of these plants, we first analyzed the chemical
composition of the essential oils. A total of 16 chemical constituents accounting for 93.69% of the oil, were identified in C. citratus among which, Geranial (27.04%), neral (19.93%) and myrcene (27.04%) were the major constituents. For E. citriodora, 19 compounds representing 97.2% of the extracted oil were identified. The dominant compound of E. citriodora essential oil was citronellal (83.50%). In vivo analysis and histological assay showed that the two essential oils displayed significant dose dependent edema inhibition effect over time. They displayed strong analgesic and antipyretic properties similar to that induced by 50 mg/kg of acetylsalicylate of lysine. However, the E. citriodora essential oil was more effective than that of C. citratus. We identified significant numbers of aldehyde molecules in both essential oils mediating antioxidant activity that may contribute to the anti-inflammatory effects observed on the rats. Altogether, this work demonstrates the anti-inflammatory property of C. citratus and E. citriodora suggesting their potential role as adjuvant therapeutic alternatives in dealing with inflammatory-related diseases.

PHYTOCHEMICAL COMPOSITION OF CYMBOPOGON CITRATUS AND EUCALYPTUS CITRIODORA ESSENTIAL OILS AND THEIR ANTI-INFLAMMATORY AND ANALGESIC PROPERTIES ON WISTAR RATS.


Treatment of pityriasis versicolor with topical application of essential oil of Cymbopogon citratus

BACKGROUND: Pityriasis versicolor is a fungal infection caused by Malassezia spp. that has frequent relapses.

OBJECTIVES: The main objective of this research was to perform phase I and II clinical studies, using formulations containing essential oil of Cymbopogon citratus in patients with pityriasis versicolor.

METHODS: Phase I study included twenty volunteers to ascertain the safety of the formulations. In phase II, 47 volunteers randomly received essential oil formulations at 1.25 µL/mL concentration, for forty days. The shampoo should be applied three times a week and the cream twice a day. A control group in phase II, consisting of 29 volunteers, received the same formulations but with 2% ketoconazole as the active ingredient.
RESULTS: No significant adverse events were observed in volunteers during Phase I. In Phase II, 30 (63.83%) volunteers using essential oil and 18 (62.07%) using ketoconazole remained until the end of the study. We observed a predominance of lesions in disseminated form, with M. sympodialis detected as the predominant agent identified in cultures. After 40 days of treatment, the rate of mycological cure was 60% (p <0.05) for the group treated with essential oil of C. citratus and over 80% (p <0.05) for the group treated with ketoconazole formulations.

CONCLUSIONS: Notwithstanding the safety and antifungal effects observed in this study after application of formulations containing the essential oil of C. citratus, further studies with larger populations should be performed to confirm the actual potential of these formulations in the treatment of patients with Pityriasis versicolor.

TREATMENT OF PITYRIASIS VERSICOLOR WITH TOPICAL APPLICATION OF ESSENTIAL OIL OF CYMBOPOGON CITRATUS (DC) STAPF – THERAPEUTIC PILOT STUDY.


Lemongrass essential oil and its major constituent induce apoptosis in human leukaemia HL-60 cells

An essential oil from a lemon grass variety of Cymbopogon flexuosus (CFO) and its major chemical constituent sesquiterpene isointermedeol (ISO) were investigated for their ability to induce apoptosis in human leukaemia HL-60 cells because dysregulation of apoptosis is the hallmark of cancer cells. CFO and ISO inhibited cell proliferation with 48 h IC50 of approximately 30 and 20 microg/ml, respectively. Both induced concentration dependent strong and early apoptosis as measured by various end-points, e.g. annexinV binding, DNA laddering, apoptotic bodies formation and an increase in hypo diploid sub-G0 DNA content during the early 6h period of study. This could be because of early surge in ROS formation with concurrent loss of mitochondrial membrane potential observed. Both CFO and ISO activated apical death receptors TNFR1, DR4 and caspase-8 activity. Simultaneously, both increased the expression of mitochondrial cytochrome c protein with its concomitant release to cytosol leading to caspase-9 activation, suggesting thereby the involvement of both the intrinsic and extrinsic pathways of apoptosis. Further, Bax translocation, and decrease in nuclear NF-kappaB expression predict multi-target effects of the essential oil and ISO while both appeared to follow similar signaling apoptosis pathways. The easy and
abundant availability of the oil combined with its suggested mechanism of cytotoxicity make CFO highly useful in the development of anti-cancer therapeutics (bold for emphasis).

AN ESSENTIAL OIL (LEMONGRASS) AND ITS MAJOR CONSTITUENT ISOINTERMEDEOL INDUCE APOPTOSIS BY INCREASED EXPRESSION OF MITOCHONDRIAL CYTOCHROME C AND APICAL DEATH RECEPTORS IN HUMAN LEUKAEMIA HL-60 CELLS


Antinociceptive action and redox properties of citronellal, an essential oil present in lemongrass

Citronellal (CT) is a monoterpenoid and the major constituent of the mixture of terpenoids that give the citronella oil its lemon scent. Citronella oil is widely used around the world for various purposes and is mainly obtained from plants of the Cymbopogon genus, which are known as "lemongrass." Considering these plants have been used worldwide for various medicinal purposes, the interest of researchers to understand the biological activities of monoterpenoids related to the Cymbopogon genus has been increasing. In the present work, we investigated the antinociceptive action and the redox properties of CT. Our results indicate that intraperitoneal injection of CT was effective in reducing nociceptive face-rubbing behavior in both phases of the formalin test, which was also naloxone-sensitive. CT also evoked antinociceptive response in the capsaicin and glutamate tests. The total radical-trapping antioxidant parameter and total antioxidant reactivity assays indicate that CT at doses of 0.1 and 1 mg/mL exerts a significant antioxidant activity, which is probably related to its ability to scavenge superoxide and nitric oxide, but not H(2)O(2) or hydroxyl radicals, as evaluated separately by specific in vitro tests. These results show for the first time the antinociceptive potential of CT and indicate that the antioxidant properties of this compound may rely on its mechanism of biological actions because CT-containing natural products are used to treat various diseases related to oxidative stress and reactive species.

ANTINOCICEPTIVE ACTION AND REDOX PROPERTIES OF CITRONELLA, AN ESSENTIAL OIL PRESENT IN LEMONGRASS.

Department of Physiology, Federal University of Sergipe, Aracaju, Sergipe, Brazil.

**Helichrysum**

**Anti-inflammatory and antioxidant properties of Helichrysum italicum**

The anti-inflammatory and antioxidant activities of the aerial part of Helichrysum italicum extracts have been established in various in-vivo and in-vitro experimental models. The results obtained on the acute oedemas induced by 12-O-tetradecanoylphorbol 13-acetate (TPA) and ethyl phenylpropiolate in the mouse ear, by serotonin and phospholipase A2 (PLA2) in the mouse paw, on chronic inflammation induced by repeated application of TPA in the mouse ear and on the delayed-type hypersensitivity induced by sheep red blood cells suggest that said anti-inflammatory activity is due to the effects of compounds expressed via a corticoid-like mechanism. In addition, the antioxidant activity of the extracts seems to be implicated in this anti-inflammatory activity, as the former inhibits enzymatic and non-enzymatic lipid peroxidation and has free-radical scavenger properties. We conclude that the anti-inflammatory activity of Helichrysum italicum can be explained by multiple effects, including inflammatory enzyme inhibition, free-radical scavenging activity and corticoid-like effects.

**ANTI-INFLAMMATORY AND ANTIOXIDANT PROPERTIES OF HELICHRYSUM ITALICUM.**


**Assessment of the anti-inflammatory activity and free radical scavenger activity of tiliroside**

Three flavonoids, gnaphaliin, pinocembrin and tiliroside, isolated from Helichrysum italicum, were studied in vitro for their antioxidant and/or scavenger properties and in vivo in different models of inflammation. In vitro tests included lipid peroxidation in rat liver microsomes, superoxide radical generation in the xanthine/xanthine oxidase system and the reduction of the stable radical 1,1-diphenyl-2-picryl-hydrazyl (DPPH). Acute inflammation was induced by application of 12-O-tetradecanoylphorbol 13-acetate (TPA) to the mouse ear or by subcutaneous injection of phospholipase A2 (PLA2) or serotonin in the mouse paw. Eczema provoked on the mouse ear by repeated administration of TPA was selected as a model of chronic inflammation. The flavonoids were assayed against sheep red blood cell-induced mouse paw oedema as a model of delayed-
type hypersensitivity reaction. The most active compound, both in vitro and in vivo, was tiliroside. It significantly inhibited enzymatic and non-enzymatic lipid peroxidation (IC(50)=12.6 and 28 microM, respectively). It had scavenger properties (IC(50)=21.3 microM) and very potent antioxidant activity in the DPPH test (IC(50)=6 microM). In vivo, tiliroside significantly inhibited the mouse paw oedema induced by phospholipase A(2) (ED(50)=35.6 mg/kg) and the mouse ear inflammation induced by TPA (ED(50)=357 microg/ear). Pinocembrin was the only flavonoid that exhibited anti-inflammatory activity in the sheep red blood cell-induced delayed-type hypersensitivity reaction. However, only tiliroside significantly reduced the oedema and leukocyte infiltration induced by TPA. As in the case of other flavonoids, the anti-inflammatory activity of tiliroside could be based on its antioxidant properties, although other mechanisms are probably involved.

ASSESSMENT OF THE ANTI-INFLAMMATORY ACTIVITY AND FREE RADICAL SCAVENGER ACTIVITY OF TILIROSIDE.


Helichrysum italicum extract interferes with the production of enterotoxins by Staphylococcus aureus

The purpose of this work was to evaluate the effect of Helichrysum italicum extract on enterotoxin (A-D) production by Staphylococcus aureus strains.

METHODS AND RESULTS: The production of enterotoxins A-D in the presence or absence of H.italicum diethyl ether extract was estimated in microtiter plates using a reversed passive latex agglutination (SET-RPLA) kit (Oxoid, Basingstoke, UK). The results indicate that, in culture medium, inhibition of staphylococcal growth and enterotoxins appeared with 250-125 microg ml(-1) of the extract. Lower concentrations of the extract (62.5-31.25 microg ml(-1)) did not affect the final viable count of Staph. aureus but reduced the production of enterotoxins B and C.

CONCLUSIONS: H. italicum interferes with growth and production of enterotoxins by Staph. aureus.

SIGNIFICANCE AND IMPACT OF THE STUDY: There is considerable interest in the use of natural compounds as alternative methods to control undesirable pathogenic micro-organisms.
Helichrysum italicum extract interferes with the production of enterotoxins by Staphylococcus aureus.


Basil

The potential of use basil and rosemary essential oils as effective antibacterial agents

The considerable therapeutical problems of persistent infections caused by multidrug-resistant bacterial strains constitute a continuing need to find effective antimicrobial agents. The aim of this study was to demonstrate the activities of basil (Ocimum basilicum L.) and rosemary (Rosmarinus officinalis L.) essential oils against multidrug-resistant clinical strains of Escherichia coli. A detailed analysis was performed of the resistance of the drug to the strains and their sensitivity to the tested oils. The antibacterial activity of the oils was tested against standard strain Escherichia coli ATCC 25922 as well as 60 other clinical strains of Escherichia coli. The clinical strains were obtained from patients with infections of the respiratory tract, abdominal cavity, urinary tract, skin and from hospital equipment. The inhibition of microbial growth by both essential oils, presented as MIC values, were determined by agar dilution. Susceptibility testing to antibiotics was carried out using disc diffusion. The results showed that both tested essential oils are active against all of the clinical strains from Escherichia coli including extended-spectrum β-lactamase positive bacteria, but basil oil possesses a higher ability to inhibit growth. These studies may hasten the application of essential oils in the treatment and prevention of emergent resistant strains in nosocomial infections.

THE POTENTIAL OF USE BASIL AND ROSEMARY ESSENTIAL OILS AS EFFECTIVE ANTIBACTERIAL AGENTS.

Biological effects, antioxidant and anticancer activities of marigold and basil essential oils

The essential oils isolated from Tagetes minuta L. flowers and Ocimum basilicum L. herb were analyzed by GC/MS and assessed for antioxidant and in vitro and in vivo anticancer activities. Also biological effects of these essential oils on normal mice were studied. The major components of marigold essential oil were cis-β-ocimene (54.82%), cis-tagetone (11.50%) and trans-tagetenone (10.78%), cistagetenone (7.10%), dihydrotagetone (6.50%) and limonene (3.82%). The major components of basil essential oil were estragole (75.45%), 1,8-cineole (7.56%), linalool (5.01%), trans-anethole (3.72%) and methyleugenol (3.48%). The DPPH· scavenging activities of both essential oils were determined. 50% effective concentration (EC50) of marigold essential oil (86.35 µg/ml) was higher than basil essential oil (80.84 µg/ml). The anticancer activity of the two essential oils on two human promyelocytic leukemia cell lines (HL-60 and NB4) and experimental animals model cancer cell line (EACC) were investigated in vitro. The results indicated that the anticancer activity of marigold essential oil was higher than basil essential oil against NB4 and EACC cell lines, while basil essential oil was higher than marigold essential oil against HL-60 cell line. In in vivo study, pre-initiation treatments with the both essential oils were more effective than initiation and post-initiation treatments, respectively on the tumor (EACC) transplanted female mice. Biological effects of both essential oils on normal mice indicated that all the obtained values in all experimental animals were within the normal range.

BIOLOGICAL EFFECTS, ANTIOXIDANT AND ANTICANCER ACTIVITIES OF MARIGOLD AND BASIL ESSENTIAL OILS.

Journal of Medicinal Plants Research Vol. 7(10), pp. 561-572, 10 March, 2013. Ghada I. Mahmoud. Biochemistry Department, Faculty of Agriculture, Cairo University, Giza, Egypt. Email: ghadaibraheim@yahoo.com

Anti-inflammatory effect of myristicin on RAW 264.7 macrophages

Myristicin (1-allyl-5-methoxy-3,4-methylenedioxybenzene) is an active aromatic compound found in nutmeg (the seed of Myristica fragrans), carrot, basil, cinnamon, and parsley. Myristicin has been known to have anti-cholinergic, antibacterial, and hepatoprotective effects, however, the effects of myristicin on virus-stimulated macrophages are not fully reported. In this study, the anti-inflammatory effect of myristicin on double-stranded RNA (dsRNA)-stimulated macrophages was examined. Myristicin did not reduce the cell viability of RAW 264.7 mouse macrophages at concentrations of up to 50 µM. Myristicin significantly inhibited the production of calcium, nitric oxide (NO), interleukin (IL)-6, IL-10, interferon inducible protein-10, monocyte chemotactic protein(MCP)-1, MCP-3, granulocyte-macrophage colony-stimulating factor, macrophage
inflammatory protein (MIP)-1α, MIP-1β, and leukemia inhibitory factor in dsRNA[polyinosinic-polycytidylic acid]-induced RAW 264.7 cells (P < 0.05). In conclusion, myristicin has anti-inflammatory properties related with its inhibition of NO, cytokines, chemokines, and growth factors in dsRNA-stimulated macrophages via the calcium pathway.

ANTI-INFLAMMATORY EFFECT OF MYRISTICIN ON RAW 264.7 MACROPHAGES STIMULATED WITH POLYINOSINIC-POLYCYTIDYLIC ACID.

Molecules. 2011;16(8):7132-42. Lee JY, Park W.

Topical dermal application of essential oils attenuates the severity of adjuvant arthritis

This study was aimed at examining the effect of an ointment containing essential oils (EO) on the severity of adjuvant arthritis (AA), an experimental model of human rheumatoid arthritis (RA), in Lewis rats and to define the underlying mechanisms. At the onset of AA, the rats received topical application twice daily of an ointment containing 20% EO or placebo ointment. The synovial fluid (SF) and synovium-infiltrating cells (SIC) of rats were tested for pro-inflammatory cytokines TNF-α and IL-1β. The hind paws and skin were examined histologically. The activity/level of matrix metalloproteinases (MMPs) and anti-mycobacterial heat-shock protein 65 (Bhsp65) antibodies were tested. Arthritic rats treated with ointment containing EO developed less severe clinical arthritis compared with the controls, and this activity was attributable to EO and not to the carrier oil. The levels of TNF-α and IL-1β, and the activity of MMPs in SF and SIC-lysate were significantly reduced in EO-treated arthritic rats compared with the controls. However, the levels of anti-Bhsp65 antibodies were unaffected by treatment. Thus, topical dermal delivery of EO-containing ointment down-modulates the severity of AA in Lewis rats by inhibiting defined mediators of inflammation. Such ointments should be tested in patients with RA and other arthritic conditions.

TOPICAL DERMAL APPLICATION OF ESSENTIAL OILS ATTENUATES THE SEVERITY OF ADJUVANT ARTHRITIS IN LEWIS RATS.

Respiratory

Many of the oils in this blend have been studied for their abilities to open and soothe the tissues of the respiratory system and also for their abilities to combat airborne bacteria and viruses that could be harmful to the system.

Single oils contained in this blend

**Laurel Leaf (bay)**
Has antiseptic and antifungal properties. It may also help with asthma, bronchitis, and viral infections.

**Peppermint**
Is antiseptic, antispasmodic, and anti-inflammatory. It is soothing, cooling, and dilating to the system.

**Eucalyptus radiata**
May have a profound antiviral effect upon the respiratory system. It may also help reduce inflammation of the nasal mucous membrane.

**Melaleuca alterifolia**
Has antibacterial, antifungal, antiviral, and expectorant properties. It may also help with bronchitis, coughs, and inflammation.

**Lemon**
Promotes health, healing, physical energy, and purification. Its fragrance is invigorating, enhancing, and warming. It is an antiseptic and is great for the respiratory system.

**Ravensara**
Is a powerful antiviral, antibacterial, antifungal and anti-infectious oil. It may help dilate, open, and strengthen the respiratory system. As a cross between clove and nutmeg, it may also help support the adrenal glands.

**Common primary uses**
Antiviral, anxiety, asthma, bronchitis, congestion, cough, emphysema, influenza, mono, nasal polyp, pneumonia, respiratory system, sinusitis, tuberculosis

**Body systems affected**
The oils in this blend may help it be effective for dealing with various problems related to the respiratory system and to the skin.

**Aromatic influence**
This blend of oils is excellent for opening the respiratory system when the blend is diffused or inhaled and is perfect for nighttime diffusion, allowing for restful sleep.
Eucalyptus
Properties
Analgesic, antibacterial, anticatarrhal, anti-infectious, anti-inflammatory, antiviral insecticidal, and expectorant

Common primary uses
Arterial vasodilator, asthma, brain blood flow, bronchitis, congestion, cooling (body), coughs, diabetes, disinfectant, dysentery, ear inflammation, emphysema, expectorant, fever, flu (influenza), hypoglycemia, inflammation, iris inflammation, jet lag, kidney stones, lice, measles, neuralgia, neuritis, over exercised muscles, pain, pneumonia, respiratory viruses, rhinitis, shingles, sinusitis, tennis elbow, tuberculosis

Other possible uses
This oil, when combined with bergamot, has been used effectively on herpes simplex. It may also help with acne, endometriosis hay fever, high blood pressure, nasal mucous membrane inflammation, and vaginitis.

Body systems affected
Respiratory system, skin

Melaleuca (Tea tree)
Properties
Analgesic, antibacterial, antifungal, anti-infectious, anti-inflammatory, antioxidant, antiparasitic, a strong antiseptic, antiviral, decongestant, digestive, expectorant, immune stimulant, insecticidal, neurotonic, stimulant, and tissue regenerative

Common primary uses
Acne, allergies, aneurysm, athletes foot, bacterial infections, boils, bronchitis, Candida, canker sores, cavities, chicken pox, cleansing, cold sores, colds (common), cough's, cuts, dermatitis/eczema, dry/itchy eyes, ear infections earache, flu (influenza), fungal infections, gum disease, hepatitis, herpes simplex, hives, immune system (stimulates) infected wounds, infection, inflammation, jock itch, lice, MRSA, mumps, nail infection, pink eye, rashes, ringworm, rubella, scabies, shingles, shock, sore throat, staph infection, sunburn, thrush, tonsillitis, vaginal infection, varicose ulcer viral infections, warts, wounds.

Other possible uses
This oil may help burns, digestion, hysteria, infectious diseases, mites and ticks

Body systems affected
Immune and respiratory systems, muscles and bones, skin

Aromatic influence
It promotes cleansing and purity

Rosemary
Properties
Analgesic, antibacterial, anticancer, anticatarrhal, antifungal, anti-infectious, anti-inflammatory, antioxidant and expectorant

Common primary uses
Addictions (alcohol), adenitis, antioxidant, arterial vasodilator, arthritis, bell's palsy, cancer, cellulite, chemical stress, cholera, club foot, constipation,
detoxification, diabetes, diuretic, fainting, fatigue, flu (influenza), greasy/oily hair, hair (loss), headaches, inflammation, kidney infection, lice, low blood sugar pressure, memory, muscular dystrophy, osteoarthritis, Schmidt’s syndrome, sinusitis, vaginal infection, vaginitis, viral hepatitis, worms

**Historical uses**
The rosemary plant was regarded as sacred by many civilizations. It was used as a fumigant to help drive away evil spirits and to protect against plague and infectious illness.

**Other possible uses**
This oil may help arteriosclerosis, bronchitis, chills, colds, colitis, cystitis, dyspepsia, nervous exhaustion, immune system (stimulant), otitis, palpitations, prevent respiratory infections, soar stomach, stressed related illness. Note: this chemotype is said to be best used for pulmonary congestion, slow elimination, Candida, chronic fatigue, and infections (especially staph and strep)

**Body systems affected**
Immune, respiratory, and nervous systems

**Aromatic influence**
Stimulates memory and opens the conscious mind

**Breathe/Melaleuca/Eucalyptus**

**Phytochemical composition of Cymbopogon citratus and Eucalyptus citriodora essential oils and their anti-inflammatory and analgesic properties**

Cymbopogon citratus and Eucalyptus citriodora are widely used herbs/plants as a source of ethnomedicines in tropical regions of the world. In this work, we studied the anti-inflammatory and gastroprotective effects of C. citratus and E. citriodora essential oils on formol-induced edema, and acetic acid induced abdominal cramps in Wistar rats. To fully understand the chemically induced anti-inflammatory properties of these plants, we first analyzed the chemical composition of the essential oils. A total of 16 chemical constituents accounting for 93.69 % of the oil, were identified in C. citratus among which, Geranial (27.04 %), neral (19.93 %) and myrcene (27.04 %) were the major constituents. For E. citriodora, 19 compounds representing 97.2 % of the extracted oil were identified. The dominant compound of E. citriodora essential oil was citronellal (83.50 %). In vivo analysis and histological assay showed that the two essential oils displayed significant dose dependent edema inhibition effect over time. They displayed strong analgesic and antipyretic properties similar to that induced by 50 mg/kg of acetylsalicylate of lysine. However, the E. citriodora essential oil was more effective than that of C. citratus. We identified significant numbers of aldehyde molecules in both essential oils mediating antioxidant activity that may contribute to the anti-inflammatory effects observed on the rats. Altogether, this work demonstrates the anti-inflammatory property of C. citratus and E. citriodora
suggesting their potential role as adjuvant therapeutic alternatives in dealing with inflammatory-related diseases.

PHYTOCHEMICAL COMPOSITION OF CYMBOPOGON CITRATUS AND EUCALYPTUS CITRIODORA ESSENTIAL OILS AND THEIR ANTI-INFLAMMATORY AND ANALGESIC PROPERTIES ON WISTAR RATS.


In vitro activity of Melaleuca alternifolia and Eucalyptus globulus essential oils on oral Candida

Melaleuca alternifolia and Eucalyptus globulus essential oils are known for their antifungal activities and efficacy in the treatment of oral candidiasis. Candida biofilm increased resistance to antifungal agents that have activity against their planktonic cells. The aim of this study was to evaluate the potential role of M. alternifolia and E. globulus essential oils in the inhibition of Candida biofilm formation on polymethylmethacrylate (PMMA). The antifungal activity of M. alternifolia and E. globulus essential oils and adhesion and biofilm on PMMA inhibition capacity were tested on two oral Candida isolates and two reference type strains. The biofilm formation by Candida strains was quantified by colorimetric method based on the reduction of the 2, 3-bis (2-methoxy-4-nitro-5-sulfophenyl)-5-[(phenyl amino) carbonyl]-2H-tetrazolium hydroxide (XTT). M. alternifolia and E. globulus essential oils were active against clinical and reference Candida albicans and Candida glabrata strains in their planktonic and adherent phases. In fact, both minimum inhibition concentration (MIC) and 1/2 MIC values of these two plants essential oils can inhibit adhesion and biofilm formation of clinical and reference strains of Candida on PMMA. Also, E. globulus essential oil was more active on Candida biofilm formation on PMMA. M. alternifolia and E. globulus essential oils can inhibit Candida biofilm formation on PMMA. This may contribute to the use of these plants as alternative products for oral Candida biofilm prevention, control and treatment.

IN VITRO ACTIVITY OF MELALEUCA ALTERNIFOLIA (TEA TREE) AND EUCALYPTUS GLOBULUS ESSENTIAL OILS ON ORAL CANDIDA BIOFILM FORMATION ON POLYMETHYL METHACRYLATE

Antiviral activity of Australian tea tree oil and eucalyptus oil against herpes simplex virus in cell culture

The antiviral effect of Australian tea tree oil (TTO) and eucalyptus oil (EUO) against herpes simplex virus was examined. Cytotoxicity of TTO and EUO was evaluated in a standard neutral red dye uptake assay. Toxicity of TTO and EUO was moderate for RC-37 cells and approached 50% (TC50) at concentrations of 0.006% and 0.03%, respectively. Antiviral activity of TTO and EUO against herpes simplex virus type 1 (HSV-1) and herpes simplex virus type 2 (HSV-2) was tested in vitro on RC-37 cells using a plaque reduction assay. The 50% inhibitory concentration (IC50) of TTO for herpes simplex virus plaque formation was 0.0009% and 0.0008% and the IC50 of EUO was determined at 0.009% and 0.008% for HSV-1 and HSV-2, respectively. Australian tea tree oil exhibited high levels of virucidal activity against HSV-1 and HSV-2 in viral suspension tests. At noncytotoxic concentrations of TTO plaque formation was reduced by 98.2% and 93.0% for HSV-1 and HSV-2, respectively. Noncytotoxic concentrations of EUO reduced virus titers by 57.9% for HSV-1 and 75.4% for HSV-2. Virus titers were reduced significantly with TTO, whereas EUO exhibited distinct but less antiviral activity. In order to determine the mode of antiviral action of both essential oils, either cells were pretreated before viral infection or viruses were incubated with TTO or EUO before infection, during adsorption or after penetration into the host cells. Plaque formation was clearly reduced, when herpes simplex virus was pretreated with the essential oils prior to adsorption. These results indicate that TTO and EUO affect the virus before or during adsorption, but not after penetration into the host cell. Thus TTO and EUO are capable to exert a direct antiviral effect on HSV. Although the active antiherpes components of Australian tea tree and eucalyptus oil are not yet known, their possible application as antiviral agents in recurrent herpes infection is promising.

Effect of eucalyptus essential oil on respiratory bacteria and viruses

The activity of Eucalyptus globulus essential oil was determined for 120 isolates of Streptococcus pyogenes, 20 isolates of S. pneumoniae, 40 isolates of S. agalactiae, 20 isolates of Staphylococcus aureus, 40 isolates of Haemophilus
influenzae, 30 isolates of H. parainfluenzae, 10 isolates of Klebsiella pneumoniae, 10 isolates of Stenotrophomonas maltophilia and two viruses, a strain of adenovirus and a strain of mumps virus, all obtained from clinical specimens of patients with respiratory tract infections. The cytotoxicity was evaluated on VERO cells by the MTT test. The antibacterial activity was evaluated by the Kirby Bauer paper method, minimum inhibitory concentration, and minimum bactericidal concentration. H. influenzae, parainfluenzae, and S. maltophilia were the most susceptible, followed by S. pneumoniae. The antiviral activity, assessed by means of virus yield experiments titered by the end-point dilution method for adenovirus, and by plaque reduction assay for mumps virus, disclosed only a mild activity on mumps virus.

EFFECT OF EUCALYPTUS ESSENTIAL OIL ON RESPIRATORY BACTERIA AND VIRUSES.


Antibacterial, antifungal, and anticancer activities of volatile oils and extracts from stems, leaves, and flowers of Eucalyptus

Eucalyptus species leaves have been traditionally used to heal wounds and fungal infections. Essential oils and extracts of some Eucalyptus species possess antimicrobial and antitumor properties. We sought to determine antimicrobial and cytotoxic activities of oils and extracts of leaves, stems, and flowers of Eucalyptus sideroxylon and Eucalyptus torquata grown in Egypt. An agar diffusion method was used to analyze antimicrobial activities of essential oils and extracts of Eucalyptus against medically important gram-positive and gram-negative bacteria. A sulphorhodamine B assay was used to analyze the in vitro cytotoxic activities of oils and extracts against Human hepatocellular carcinoma cell line (HEPG2), and Human breast adenocarcinoma cell line (MCF7). Gram-positive bacteria were highly susceptible to oils and extracts of both Eucalyptus species. With the exception of Escherichia coli, gram-negative bacteria were resistant to extracts, but susceptible to the oil obtained from at least one organ of E sideroxylon and E torquata. Although Aspergillus flavus and Aspergillus niger were resistant to the extracts, essential oils of E sideroxylon and E torquata generally exhibited moderate to high antifungal activities against Candida albicans, A flavus and A niger. Oils of E torquata stems exhibited cytotoxic activities on MCF7 cells followed by oils of E torquata leaves and E sideroxylon leaves. However, oils from both species failed to exert cytotoxic effects on HEPG2 cells. This is the first report of antimicrobial and antitumor properties of E sideroxylon and E torquata. Results suggest a wider use of Eucalyptus species products in pharmaceutical, cosmetic, and food preparations.
Inhibition of group A streptococcal infection by Melaleuca alternifolia oil

AIMS: To investigate the effect of a water-soluble Melaleuca alternifolia concentrate (MAC) on group A streptococcus (GAS; Streptococcus pyogenes)-induced necrotizing fasciitis.

METHODS AND RESULTS: MAC pretreatment (1% and 2% v/v) was able to protect mice from GAS infection in an air pouch model. GAS-induced mouse death and skin injury were inhibited dose dependently by MAC. Administration of MAC at 6 h post-GAS infection partially delayed mouse death. Surveys of the exudates of the air pouch of MAC-treated mice revealed that the survival of infiltrating cells was prolonged, the bacteria were eliminated, and the production of inflammatory cytokines was inhibited. MAC could directly inhibit the growth of GAS in vitro, and the minimal inhibitory concentration (MIC) of MAC for GAS was determined as 0.05% v/v using the time-kill assay. Furthermore, a sub-MIC dose of MAC not only enhanced the bactericidal activity of RAW264.7 macrophage cells against GAS but also increased susceptibility of GAS for blood clearance.

CONCLUSIONS: These results suggest that MAC may inhibit GAS-induced skin damage and mouse death by directly inhibiting GAS growth and enhancing the bactericidal activity of macrophages.

SIGNIFICANCE AND IMPACT OF THE STUDY: Our results provide scientific data on the use of MAC for the treatment of GAS-induced necrotizing fasciitis in the murine model.

INHIBITION OF GROUP A STREPTOCOCCAL INFECTION BY MELALEUCA ALTERNIFOLIA (TEA TREE) OIL CONCENTRATE IN THE MURINE MODEL.

The mode of antimicrobial action of the essential oil of Melaleuca alternifolia

The essential oil of Melaleuca alternifolia (tea tree) exhibits broad-spectrum antimicrobial activity. Its mode of action against the Gram-negative bacterium Escherichia coli AG100, the Gram-positive bacterium Staphylococcus aureus NCTC 8325, and the yeast Candida albicans has been investigated using a range of methods. We report that exposing these organisms to minimum inhibitory and minimum bactericidal/fungicidal concentrations of tea tree oil inhibited respiration and increased the permeability of bacterial cytoplasmic and yeast plasma membranes as indicated by uptake of propidium iodide. In the case of E. coli and Staph. aureus, tea tree oil also caused potassium ion leakage. Differences in the susceptibility of the test organisms to tea tree oil were also observed and these are interpreted in terms of variations in the rate of monoterpane penetration through cell wall and cell membrane structures. The ability of tea tree oil to disrupt the permeability barrier of cell membrane structures and the accompanying loss of chemiosmotic control is the most likely source of its lethal action at minimum inhibitory levels.

THE MODE OF ANTIMICROBIAL ACTION OF THE ESSENTIAL OIL OF MELALEUCA ALTERNIFOLIA (TEA TREE OIL).


Activity of Melaleuca alternifolia (tea tree) oil on Influenza virus

Our previous study demonstrated that Melaleuca alternifolia (tea tree) oil (TTO) had an interesting antiviral activity against Influenza A in MDCK cells. In fact, when we tested TTO and some of its components, we found that TTO had an inhibitory effect on influenza virus replication at doses below the cytotoxic dose; terpinen-4-ol, terpinolene, and alfa-terpineol were the main active components. The aim of this study was to investigate the mechanism of action of TTO and its active components against Influenza A/PR/8 virus subtype H1N1 in MDCK cells. None of the test compounds showed virucidal activity nor any protective action for the MDCK cells. Thus, the effect of TTO and its active components on different steps of the replicative cycle of influenza virus was studied by adding the test compounds at various times after infection. These experiments revealed that viral replication was significantly inhibited if TTO was added within 2h of infection, indicating an interference with an early step of the viral replicative cycle of influenza virus. The influence of the compound on the virus adsorption step, studied by the infective center assay, indicated that TTO did not interfere with cellular attachment of the virus. TTO did not inhibit influenza virus neuraminidase
activity, as shown by the experiment measuring the amount of 4-methylumbelliferone, cleaved by the influenza virus neuraminidase from the fluorogenic substrate 2′-O-(4-methylumbelliferyl)-N-acetylneuraminic acid. The effect of TTO on acidification of cellular lysosomes was studied by vital staining with acridine orange using bafilomycin A1 as positive control. The treatment of cells with 0.01% (v/v) of TTO at 37°C for 4h before staining inhibited the acridine orange accumulation in acid cytoplasmic vesicles, indicating that TTO could inhibit viral uncoating by an interference with acidification of intralysosomal compartment.

ACTIVITY OF MELALEUCA ALTERNIFOLIA (TEA TREE) OIL ON INFLUENZA VIRUS A/PR/8: STUDY ON THE MECHANISM OF ACTION.


Tea tree oil reduces histamine-induced skin inflammation

BACKGROUND:

Tea tree oil is the essential oil steam-distilled from Melaleuca alternifolia, an Australian native plant. In recent years it has become increasingly popular as an antimicrobial for the treatment of conditions such as tinea pedis and acne.

OBJECTIVES:

To investigate the anti-inflammatory properties of tea tree oil on histamine-induced weal and flare.

METHODS:

Twenty-seven volunteers were injected intradermally in each forearm (study and control assigned on an alternating basis) with histamine diphosphate (5 microg in 50 microL). Flare and weal diameters and double skin thickness were measured every 10 min for 1 h to calculate flare area and weal volume. At 20 min, 25 microL of 100% tea tree oil was applied topically to the study forearm of 21 volunteers. For six volunteers, 25 microL paraffin oil was applied instead of tea tree oil.

RESULTS:

Application of liquid paraffin had no significant effect on histamine-induced weal and flare. There was also no difference in mean flare area between control arms.
and those on which tea tree oil was applied. However, mean weal volume significantly decreased after tea tree oil application (10 min after tea tree oil application, \( P = 0.0004 \), Mann-Whitney U-test).

CONCLUSIONS:

This is the first study to show experimentally that tea tree oil can reduce histamine-induced skin inflammation.

**TEA TREE OIL REDUCES HISTAMINE-INDUCED SKIN INFLAMMATION.**


**Antimycotic activity of Melaleuca alternifolia essential oil and its major components**

The aim of this study was to analyse the antimycotic properties of Melaleuca alternifolia essential oil (tea tree oil, TTO) and its principal components and to compare them with the activity of 5-fluorocytosine and amphotericin B.

**METHODS AND RESULTS:** The screening for the antimycotic activity was performed by serial twofold dilutions in Roswell Park Memorial Institute medium with the inclusion of Tween-80 (0.5%). TTO and terpinen-4-olo were the most active compounds.

**CONCLUSIONS:** The majority of the organisms were sensitive to the essential oil, with TTO and terpinen-4-olo being the most active oils showing antifungal activity at minimum inhibitory concentration values lower than other drugs.

**SIGNIFICANCE AND IMPACT OF THE STUDY:** This study provides a sample large enough to determine the antifungal properties of TTO and terpinen-4-olo and suggests further studies for a possible therapeutic use.

**ANTIMYCOTIC ACTIVITY OF MELALEUCA ALTERNIFOLIA ESSENTIAL OIL AND ITS MAJOR COMPONENTS**

Lett Appl Microbiol. 2003;37(2):185-7. Oliva B, Piccirilli E, Ceddia T, Pontieri E, Aureli P, Ferrini AM. Department of Experimental Medicine, Section of Microbiology, University of L’Aquila, L’Aquila, Italy.
Rosemary

Rosmarinus officinalis essential oil as antihypotensive agent in primary hypotensive patients

ETHNOPHARMACOLOGICAL RELEVANCE: To study Rosmarinus officinalis (Rosemary) essential oil effect on primary hypotension and its influence on both physical and psychological aspects responsible for health-related quality of life (HRQOL) of patients.

METHODOLOGY: Thirty-two patients with diagnosed hypotension were recruited between March 2007 and September 2008 for a prospective study for 72 weeks in a Spanish pharmacy. Clinical evaluation was carried out through the control of systolic and diastolic blood pressure levels (SBP and DBP, respectively) according to the International Standards from the American Society of Hypertension. HRQOL data were recorded within the SF-36 Health Survey® questionnaire throughout the study. Statistical methods were used as the essential tools to evaluate the effectiveness of Rosemary essential oil and to assess the relationship between the two quantitative variables (SBP and DBP) and scores from physical and mental summary components (PSC and MSC) obtained from the SF-36 Health Survey.

RESULTS: Both blood pressure variables of SBP and DBP reflect the clinically significant antihypotensive effect of Rosemary essential oil that was maintained throughout the treatment period. After validation of the use of the questionnaire (Cronbach’s alpha coefficient>0.82), statistically significant differences have been found between pre-treatment and post-treatment values of PSC and MSC, which indicate an improvement in these parameters that is directly related to the variation in blood pressure values.

CONCLUSIONS: The increase achieved in blood pressure values after administration of Rosemary essential oil is clinically significant. The results obtained from this prospective clinical trial prove the effectiveness of statistical methodology as a new approach to explain the antihypotensive effect of rosemary essential oil and its relationship with the improvement in patients’ quality of life.

EFFECTIVENESS OF ROSMARINUS OFFICINALIS ESSENTIAL OIL AS ANTIHYPOTENSIVE AGENT IN PRIMARY HYPOTENSIVE PATIENTS AND ITS INFLUENCE ON HEALTH-RELATED QUALITY OF LIFE.

Effects of inhaled rosemary oil on subjective feelings and activities of the nervous system

Rosemary oil is one of the more famous essential oils widely used in aromatherapy. However, the effects of rosemary oil on the human body, in particular the nervous system, have not been sufficiently studied. This study investigates the effects of the inhalation of rosemary oil on test subjects’ feelings, as well as its effects on various physiological parameters of the nervous system. Twenty healthy volunteers participated in the experiment. All subjects underwent autonomic nervous system (ANS) recording. This consisted of measurements of skin temperature; heart rate; respiratory rate; blood pressure; evaluations of the subjects’ mood states; and electroencephalography (EEG) recordings in the pre-, during treatment, and post-rosemary inhalation periods as compared with control conditions. Our results showed significant increases in blood pressure, heart rate, and respiratory rate after rosemary oil inhalation. After the inhalation treatments, subjects were found to have become more active and stated that they felt “fresher”. The analysis of EEGs showed a reduction in the power of alpha1 (8-10.99 Hz) and alpha2 (11-12.99 Hz) waves. Moreover, an increment in the beta wave (13-30 Hz) power was observed in the anterior region of the brain. These results confirm the stimulatory effects of rosemary oil and provide supporting evidence that brain wave activity, autonomic nervous system activity, as well as mood states are all affected by the inhalation of the rosemary oil.

EFFECTS OF INHALED ROSEMARY OIL ON SUBJECTIVE FEELINGS AND ACTIVITIES OF THE NERVOUS SYSTEM.


Insomnia

Serenity
This relaxing blend contains essential oils that are often used to help calm and soothe feelings of stress, excitement, and anxiety in order to help the body maintain its natural state of health.

Single oils contained in this blend
**Lavender**
Has calming and sedative properties. It may help lift feelings of depression and anxiety.

**Sweet Marjoram**
May help relax and calm the body and mind and also help promote peace.

**Roman Chamomile**
Is calming and relaxing, it may help relieve muscle tension as well as calm nerves and soothe emotions.

**Ylang Ylang**
Has calming and sedative properties. It brings a feeling of self-love, confidence, joy, and peace.

**Sandalwood**
Is calming and sedative. It helps balance and harmonizes the emotions and may help ease nervous tension.

**Vanilla**
Is calming and may help ease tension

**Common primary uses**
Add/adhd, addictions, anger, anxiety, calming, hyperactivity
Insomnia, itching mental fatigue, mood swings, sedative, sleep, stress, teeth grinding, tension

**Body systems affected**
The oils in this blend may help it be effective for dealing with various problems related to the nervous system and to emotional balance.

**Aromatic influence**
This blend of oils is perfect for calming the nerves or emotions at the end of a long day or in times of stress. As the body is able to relax, more blood is able to circulate to the brain.

**Lavender**
Analgesic, anticoagulant, anti convulsant, antidepressant, antifungal, anti-histamine, anti-infectious, anti-inflammatory, antimicrobial, antimutagenic, antiseptic, antispasmodic, antitoxic, antitumor, cardiotonic, regenerative, and sedative.

**Common uses**
Abuse (healing from), agitation (calms), allergies, Anxiety, appetite loss, arrhythmia, atherosclerosis, bites/stings, blisters, boils, breasts (soothes), burns, calming, cancer, chicken pox, club foot, concentration, convulsions, crying, cuts, dandruff, depression, diabetic sores, diaper rash, diuretic, dysmenorrhe3a, exhaustion, fever, gangrene, gas/flatulence, giardia, gnats and midges (repellent) grief/sorrow, hair(dry), hair fragile, hair loss, hay fever, hernia (inguinal, Herpes
simplex, hyperactivity, impetigo, inflammation, insomnia, itching jet lag, lips dry, mastitis, menopause, mental stress, mood swings, mosquito repellent, muscular paralysis, pain parasympathetic nervous system stimulation, Parkinson's disease, phlebitis, physical stress, poison ivy/oak, post labor, postpartum depression, rashes, relaxation, rheumatoid arthritis, sedative, seizure, skin dry, skin sensitive, skin ulcers, sleep, stress, stretch marks, sunburn, tachycardia, teeth grinding teething pain, tension, thrush, ticks, ulcers leg, varicose ulcer, vertigo, withdrawal, worms, wounds, wrinkles.

Other possible uses
Lavender is universal oil that has traditionally been known to balance the body and to work wherever there is a need. If in doubt use lavender. It may help anxiety, arthritis, asthma, body systems balance, bronchitis, bruises, carbuncles, cold sores, earaches, fainting, gallstones, relieve headaches, heart irregularity, reduce high blood pressure, hives (urticaria, ) hysteria, insect bites, and bee stings, infection, influenza, injuries, repel insects, laryngitis, migraine, headaches, mental clarity, mouth abscess, reduce mucus, nervous tension, pineal gland activates, respiratory functions, rheumatism, skin conditions (eczema, psoriasis, rashes) sprains, sunstroke, throat infections, tuberculosis, typhoid fever, and whooping cough.

Aromatic influence
It promotes consciousness, health, love, peace, and a general sense of well-being. It also nurtures creativity.

**Roman Chamomile**

Properties
Anti-infectious, anti-inflammatory, anti parasitic, antispasmodic, calming, and relaxing.

Common primary uses
Bee/hornet stings, calming, club foot, dysentery, hyperactivity, insomnia, menopause, muscle spasms, neuralgia, Neuritis, parasites, rashes, sciatica, shock, skin (dry), sore nipples

Other possible uses
Chamomile neutralizes allergies and increases the ability of the skin to regenerate. It is a cleanser of the blood and also helps the liver to reject poisons and discharge them. This oil may help with alleges, bruises, cuts, depression, insomnia, muscle tension, nerves (calming and promoting nerve health), restless legs, and skin conditions such as acne, boils, dermatitis, eczema, rashes, and sensitive skin. Chamomile is mild enough to use on infants and children. For centuries, mothers have used chamomile to calm crying children, ease earaches, fight fevers, soothe stomachaches and colic, and relieve toothaches and teething pain, it can safely and effectively reduce irritability and minimize nervousness in children, especially hyperactive children.

Body systems affected
Emotional balance, nervous system, skin

Aromatic influence
Because it is calming and relaxing, it can combat depression, insomnia, and stress. It eliminates some of the emotional charge of anxiety, irritability, and nervousness. It may also be used to soothe and clear the mind, creating an atmosphere of peace and patience.

Serenity/Roman Chamomile/Lavender

Effect of lavender oil on cerebral edema and its possible mechanisms in an experimental model of stroke

Lavender belongs to the family Labiatae and has a variety of cosmetic uses as well as therapeutic purposes in herbal medicine. The present study was conducted to evaluate the protective effect of lavender oil against brain edema and its possible mechanisms in an experimental model of stroke. Under Laser-Doppler Flowmetry, focal cerebral ischemia was induced by the transient occlusion of the middle cerebral artery for 1h in rats. Lavender oil (100, 200, and 400mg/kg ip (and/or vehicle was injected at the onset of ischemia. Infarct size, cerebral edema, functional outcome, and oxidative stress biomarkers were evaluated using standard methods. Western blotting was used to determine the protein expression of VEGF, Bax, and Bcl-2. Treatment with lavender oil at doses of 200 and 400mg/kg significantly diminished infarct size, brain edema, and improved functional outcome after cerebral ischemia (P<0.001). Lavender oil (200mg/kg) also reduced the content of malondialdehyde and increased the activities of superoxide dismutase, glutathione peroxidase, and total antioxidant capacity (P<0.001). Although lavender oil enhanced VEGF expression (P=0.026), it could not decrease the Bax-to-Bcl-2 ratio (pro- to anti-apoptotic proteins) in the rat brain (P>0.05). The results indicated that lavender oil has neuroprotective activity against cerebral ischemia and alleviated neurological function in rats, and the mechanism may be related to augmentation in endogenous antioxidant defense, inhibiting oxidative stress, and increasing VEGF expression in the rat brain. However, lavender oil could not suppress the apoptosis pathway.

EFFECT OF LAVENDER OIL (LAVANDULA ANGUSTIFOLIA) ON CEREBRAL EDEMA AND ITS POSSIBLE MECHANISMS IN AN EXPERIMENTAL MODEL OF STROKE.

Effects of inhaled lavender essential oil on stress-loaded animals

Inhalation of various essential oils elicits behavioral changes as a consequence of a complex centrally coordinated response. To understand the molecular mechanisms of action of aromatic compounds on emotional responses, we evaluated the stress-induced changes in mouse brain and the efficacy of inhaled essential oil from Lavandula officinalis (LvEO) using two approaches: a behavioral test, and examining the expression levels of selected genes (fast nerve growth factor receptor (NGFR) mRNA, activity regulated cytoskeletal-associated protein (Arc) mRNA) and proteins {galactokinase 1 (GLK1) and brain-derived neurotrophic factor (BDNF)}. Animals were randomly divided into 4 groups depending on the treatment given: stress (-)/H2O, stress (-)/LvEO, stress (+)/H2O, and stress (+)/LvEO group. For behavioral testing, using an elevated plus-maze test, significant anxiolytic-like effects were seen in both the stress (-)/LvEO and stress (+)/LvEO groups, indicating that LvEO exerts anxiolytic-like effects regardless of the administration of water immersion stress. On expression analysis, the levels of NGFR and Arc mRNA were significantly lower in animals subjected to stress. Inhalation of LvEO, however, reversed this change, thus suggesting that LvEO negates the impact of stress on gene expression levels. Meanwhile, significant decreases in expression levels were also observed in the stress (-)/LvEO group, which implies that LvEO, when given in a stress-free situation, may act as a stress stimulus. Taken together, our data suggest that inhalation of LvEO exerts bidirectional influences in the central nervous system (CNS) of animals, either attenuating the effects of stress or acting as a stressor, depending on the subject state.

EFFECTS OF INHALED LAVENDER ESSENTIAL OIL ON STRESS-LOADED ANIMALS: CHANGES IN ANXIETY-RELATED BEHAVIOR AND EXPRESSION LEVELS OF SELECTED MRNAS AND PROTEINS.


The effects of lavender oil inhalation on emotional states, autonomic nervous system, and brain electrical activity
OBJECTIVE: Investigate the effects of lavender oil on the central nervous system, autonomic nervous system, and mood responses in humans after inhalation.

MATERIAL AND METHOD: Twenty healthy volunteers participated in the experiments. The present study assessed autonomic parameters such as blood pressure, heart rate, respiratory rate, and skin temperature to determine the arousal level of the autonomic nervous system. In addition, subjects were asked to estimate their mood responses such as feeling pleasant or unpleasant, uncomfortable, sensuality, relaxation, or refreshing in order to assess subjective behavioral arousal. Finally, electroencephalogram (EEG) was recorded from 31 electrodes on the scalp according to the international 10 to 20 system, and EEG power spectra were calculated by Fast Fourier Transform (FFT). Data was analyzed by comparing the effects of lavender oil on physiological and mood states with sweet almond oil. These assessments were measured before and after using paired t-test statistical procedure.

RESULTS: The results revealed that lavender oil caused significant decreases of blood pressure, heart rate, and skin temperature, which indicated a decrease of autonomic arousal. In terms of mood responses, the subjects in the lavender oil group categorized themselves as more active, fresher relaxed than subjects just inhaling base oil. Compared with base oil, lavender oil increased the power of theta (4-8 Hz) and alpha (8-13 Hz) brain activities. The topographic map showed obviously more scattering power in alpha range waves particularly in bilateral temporal and central area.

CONCLUSION: The findings provided evidence the relaxing effect of inhaling lavender oil.

THE EFFECTS OF LAVENDER OIL INHALATION ON EMOTIONAL STATES, AUTONOMIC NERVOUS SYSTEM, AND BRAIN ELECTRICAL ACTIVITY.


Comparative analysis between Chamomilla recutita and corticosteroids on wound healing

The comparison of chamomile and corticosteroids for treating ulcers was done in vitro and in vivo. The experimental groups were: control; chamomile recutita; triamcinolone acetonide and clobetasol propionate. For the in vitro study the cell viability of fibroblasts cultured for 24 h in media conditioned by the substances was obtained by the MTT reduction analysis. For the in vivo study, 125 male rats were submitted to experimental ulcers treated or not (control) by the substances
tested. At 1, 3, 5, 7 and 14 days later 5 animals of each group were sacrificed. The lesions were analyzed by means of clinical observation and histological wound-healing grading. Data were compared by ANOVA (p ≤ 0.05). All experimental groups presented positive cell viability in 24 h. The cultures treated with chamomile presented the smallest cell viability. All animals of the chamomile group exhibited complete wound healing 9 days before the other groups. Complete repaired lesions were observed after 5 days of treatment only in the chamomile group. Animals treated with chamomile presented significantly faster wound healing in comparison to those treated with corticosteroids. Based on the conditions of this study, we concluded that chamomile in comparison to corticosteroids promotes faster wound healing process.

COMPARATIVE ANALYSIS BETWEEN CHAMOMILLA RECUTITA AND CORTICOSTEROIDS ON WOUND HEALING. AN IN VITRO AND IN VIVO STUDY.


**Ylang ylang**

**Evaluation of the harmonizing effect of ylang-ylang oil on humans after inhalation**

Scientific evaluations of the effects of fragrances on humans are rather scarce. The aim of this investigation was to study the effects of ylang-ylang oil (Cananga odorata, Annonaceae) on human physiological parameters and self-evaluation. Twenty-four healthy volunteers participated in the experiments. Fragrances were administered by inhalation. Physiological parameters recorded were skin temperature, pulse rate, breathing rate and blood pressure. Self-evaluation was assessed in terms of alertness, attentiveness, calmness, mood, relaxation and vigor. Additionally, fragrances were rated in terms of pleasantness, intensity and effect. The present investigation showed that ylang-ylang oil may be characterized by the concept of “harmonization” rather than relaxation/sedation. Compared to an odorless placebo, ylang-ylang oil caused significant decreases in blood pressure and pulse rate as well as significant increases of subjective attentiveness and alertness. Correlational analyses revealed that the observed effects are mainly due to a subjective odor experience.

EVALUATION OF THE HARMONIZING EFFECT OF YLANG-YLANG OIL ON HUMANS AFTER INHALATION.
Effects of ylang-ylang essential oil on the relaxation of rat bladder muscle in vitro and white rabbit bladder in vivo

Current and primary treatment modality in overactive bladder includes the administration of anticholinergics. The demand for new agents has been rising since anticholinergics have proven to come with many side effects. This study was designed to investigate the effects of ylang-ylang essential oil (YYEO) on the relaxation of urinary bladder muscle in vitro and in vivo. Effects of YYEO were assessed on resting tension, and electrical field stimulation- and various drug-induced contraction in vitro by checking the isometric tension changes of muscle strips and same procedures were repeated in the presence of methylene blue, Nw-Nitro-L-arginine methyl ester hydrochloride (L-NAME), or N-ethylmaleimide, and in vivo. YYEO decreased significantly the contractility of strips. There was no statistically significant difference between the treated group only with YYEO and the pretreated group with YYEO and methylene blue or L-NAME. When N-ethylmaleimide was employed, there was a statistically significant decrease in the rate of contraction. In vivo studies showed the same results compared with in vitro study. The results of this study indicate that YYEO has a relaxing effect on the bladder, and such mechanism is thought to be brought about by a pathway mediated by c-AMP.

EFFECTS OF YLANG-YLANG ESSENTIAL OIL ON THE RELAXATION OF RAT BLADDER MUSCLE IN VITRO AND WHITE RABBIT BLADDER IN VIVO.


Relaxing effect of Ylang Ylang oil

The aim of this study was to investigate the effects of ylang ylang oil (Cananga odorata, Annonaceae) on human physiological parameters and self-evaluation after transdermal absorption. Forty healthy volunteers participated in the experiments. Physiological parameters recorded were skin temperature, pulse rate, breathing rate and blood pressure. Self-evaluation was assessed by means of visual analog scales (VAS). The ylang ylang oil caused a significant decrease of blood pressure and a significant increase of skin temperature. At the behavioral level, subjects in the ylang ylang oil group rated themselves more calm and more relaxed than subjects in the control group. These findings are
likely to represent a relaxing effect of the ylang ylang oil and provide some evidence for the usage of the ylang ylang oil in aromatherapy such as causing a relief of depression and stress in humans.

RELMAXING EFFECT OF YLANG YLANG OIL ON HUMANS AFTER TRANSDERMAL ABSORPTION

Tapanee Hongratanaworakit and Gerhard Buchbauer; Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Srinakharinwirot University, Thailand

Anxiety

Balance
This blend brings a feeling of calmness, peace, and relaxation. It can aid in harmonizing the various physiological systems of the body and promote tranquility and a sense of balance.

Single oils contained in this blend

Spruce
Grounds the body, creating the balance and the opening necessary to receive and to give. It may help dilate the bronchial tract to improve the oxygen exchange. It may also help a person to release emotional blocks.

Rosewood
Is soothing to the skin, appeasing to the mind, relaxing to the body, and creates a feeling of peace and gentleness.

Blue tansy
May help cleanse the liver and calm the lymphatic system to help rid oneself of anger and promote a feeling of self-control.

Frankincense
Contains sesquiterpenes, which may help oxygenate the pineal and pituitary glands. As one of the ingredients for the holy incense, frankincense was used anciently to help enhance one’s communication with the creator. It may help promote a positive attitude.

Common primary uses
Anxiety, back pain, balance, brain integration, bursitis, Coma, confusion, convulsions, depression, diabetic sores, energy fear, grand mal seizure, Greif/sorrow, herniated discs, hot flashes, hyperactivity, jet lag, lou gehrig's
disease, lupus, metabolism (Balance), mood swings, parkinson's disease, seizure.

**Body systems affected**
The oils in this blend may help it be effective for dealing with various problems related to muscles and bones, skin, the nervous system, and emotional balance.

**Aromatic influence**
This blend of oils may help balance the body and mind. Diffuse wherever and whenever possible.

**Elevation**
This uplifting combination of essential oils creates an energetic aroma that can help stimulate the body's chemistry when a person is feeling lethargic or sad.

**Single oils contained in this blend**

**Lavandin**
May help dispel feelings of depression or anxiety

**Tangerine**
Is sedative in nature. It may help calm and relieve feelings of stress while enhancing energy.

**Elemi**
Is antidepressant and sedative. It may help relieve stress and is calming to the nerves

**Lemon Myrtle**
Has a strong lemony aroma that is elevating and refreshing

**Melissa**
May help with depression and anxiety and has a uplifting lemony aroma

**Ylang ylang**
Is calming and relaxing. It brings a feeling of self love, confidence, joy and peace.

**Osmanthus**
Is one of the 10 famous traditional flowers in china. The blossoms are highly aromatic and are used in the world's rarest and most expensive perfumes. Its heady, uplifting fragrance (very rich, sweet floral fruit bouquet) has been known to make everyone smile

**Sandalwood**
Is calming and sedative. It helps balance and harmonizes the emotions and may help ease nervous tension.
Common Primary uses
Abuse, anxiety, Cushing’s syndrome, depression, energy Greif/sorrow, lupus, poison oak/ivy, postpartum depression, shock, stimulating, stress, uplifting, weight loss

Body systems affected
The oils in this blend may help it be effective for dealing with various problems related to emotional balance.

Aromatic influence
The fragrance of this blend of oils is uplifting, refreshing, and helps promote feelings of self-worth. It can help dispel feelings of depression, sorrow, and anxiety.

Wild Orange
Properties
Anticancer, antidepressant, antiseptic, antispasmodic, digestive, sedative, and tonic.

Common Primary uses
Anxiety, digestion (sluggish), fear, heart palpitations, insomnia, menopause, nervousness, uplifting, withdrawal.

Historical uses
Oranges, particularly the bitter oranges, have been used for palpitation, scurvy, jaundice, bleeding, heartburn, relaxed throat, prolapsed of the uterus and the anus, diarrhea, and blood in the feces.

Other possible uses
This oil may help appetite, bones (rickety), bronchitis, colds, colic (dilute for infants: helps them sleep), complexion (dull and oily), dermatitis, digestive system, fever, flu, lower high cholesterol, mouth ulcers, muscle soreness, obesity, sedation, tissue repair, water retention, and wrinkle.

Body systems affected
Digestive and immune systems, emotional balance, skin

Aromatic influence
Orange is calming and uplifting to the mind and body

Ylang ylang
Properties
Antidepressant, antiseptic, antispasmodic, sedative, and tonic

Common primary uses
Aphrodisiac, arrhythmia, calming colic, crying, diabetes, exhaustion, fear, hair (loss), high blood pressure, hormonal balance, hyperpnea, libido (low), palpitations, relaxation, sedative, stress, tachycardia, tension

Other possible uses
Ylang ylang may help with rapid breathing, balancing equilibrium, frustration, balancing heart function, impotence, infection, intestinal problems, sex drive problems, shock, and skin problems

Body systems affected
Emotional balance, cardiovascular and hormonal systems

Aromatic influence
It influences sexual energy and enhances relationships. It may help stimulate the adrenal glands; it is calming and relaxing and may help alleviate anger.

Wild Orange

Effect of aromatherapy with orange essential oil on salivary cortisol and pulse rate in children

BACKGROUND: Essential oils have been used as an alternative and complementary treatment in medicine. Citrus fragrance has been used by aromatherapists for the treatment of anxiety symptoms. Based on this claim, the aim of present study was to investigate the effect of aromatherapy with essential oil of orange on child anxiety during dental treatment.

MATERIALS AND METHODS: Thirty children (10 boys, 20 girls) aged 6-9 years participated in a crossover intervention study, according to the inclusion criteria, among patients who attended the pediatric department of Isfahan Dental School in 2011. Every child underwent two dental treatment appointments including dental prophylaxis and fissure-sealant therapy under orange aroma in one session (intervention) and without any aroma (control) in another one. Child anxiety level was measured using salivary cortisol and pulse rate before and after treatment in each visit. The data were analyzed using t-test by SPSS software version 18.

RESULTS: The mean ± SD and mean difference of salivary cortisol levels and pulse rate were calculated in each group before and completion of treatment in each visit. The difference in means of salivary cortisol and pulse rate between treatment under orange odor and treatment without aroma was 1.047 ± 2.198 nmol/l and 6.73 ± 12.3 (in minutes), which was statistically significant using paired t-test (P = 0.014, P = 0.005, respectively).

CONCLUSION: It seems that the use of aromatherapy with natural essential oil of orange could reduce salivary cortisol and pulse rate due to child anxiety state.

EFFECT OF AROMATHERAPY WITH ORANGE ESSENTIAL OIL ON SALIVARY CORTISOL AND PULSE RATE IN CHILDREN DURING DENTAL TREATMENT: A RANDOMIZED CONTROLLED CLINICAL TRIAL.

Antimicrobial effect and mode of action of orange essential oil

AIMS: The objectives of this study were to evaluate the antistaphylococcal effect and elucidate the mechanism of action of orange essential oil against antibiotic-resistant Staphylococcus aureus strains.

METHODS AND RESULTS: The inhibitory effect of commercial orange essential oil (EO) against six Staph. aureus strains was tested using disc diffusion and agar dilution methods. The mechanism of EO action on MRSA was analysed by transcriptional profiling. Morphological changes of EO-treated Staph. aureus were examined using transmission electron microscopy. Results showed that 0·1% of terpeneless cold-pressed Valencia orange oil (CPV) induced the cell wall stress stimulon consistent with the inhibition of cell wall synthesis. Transmission electron microscopic observation revealed cell lysis and suggested a cell wall lysis-related mechanism of CPV.

CONCLUSIONS: CPV inhibits the growth of Staph. aureus, causes gene expression changes consistent with the inhibition of cell wall synthesis, and triggers cell lysis.

SIGNIFICANCE AND IMPACT OF THE STUDY: Multiple antibiotics resistance is becoming a serious problem in the management of Staph. aureus infections. In this study, the altered expression of cell wall-associated genes and subsequent cell lysis in MRSA caused by CPV suggest that it may be a potential antimicrobial agent to control antibiotic-resistant Staph. aureus.

ANTIMICROBIAL EFFECT AND MODE OF ACTION OF TERPENELESS COLD-PRESSED VALENCIA ORANGE ESSENTIAL OIL ON METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS.


Sandalwood

TLC-bioautographic evaluation of in vitro anti-tyrosinase and anti-cholinesterase potentials of sandalwood oil

Sandalwood oil, rich in sesquiterpenoid alcohols, has been used in traditional medicinal systems as a relaxant and coolant. Besides, sandalwood oil is used as an ingredient in numerous skin fairness enhancing cosmetics. However, there is no available information on biological activities that relate to the above
applications. Hence, the anti-tyrosinase and anti-cholinesterase potentials of sandalwood oil were probed by both TLC-bioautographic and colorimetric methods. Results obtained from colorimetric assays indicated that sandalwood oil is a potent inhibitor of tyrosinase (IC50 = 171 microg mL(-1)) and cholinesterases (IC50 = 4.8-58 microg mL(-1)), in comparison with the positive controls used in the assays, kojic acid and physostigmine, respectively. The TLC-bioautographic assays indicated that alpha-santalol, the major constituent of the oil, is a strong inhibitor of both tyrosinase and cholinesterase. These in vitro results indicate that there is a great potential of this essential oil for use in the treatment of Alzheimer’s disease, as well as in skin-care.

TLC-BIOAUTOGRAPHIC EVALUATION OF IN VITRO ANTI-TYROSINASE AND ANTI-CHOLINESTERASE POTENTIALS OF SANDALWOOD OIL.

Nat Prod Commun. 2013 Feb;8(2):253-6. Misra BB, Dey S. Plant Biotechnology Laboratory, Department of Biotechnology, Indian Institute of Technology Kharagpur, Midnapore (West), Kharagpur-721302, West Bengal, India.

Skin cancer chemopreventive agent, alpha-santalol, induces apoptotic death of human epidermoid carcinoma

alpha-Santalol, an active component of sandalwood oil, has been studied in detail in recent years for its skin cancer preventive efficacy in murine models of skin carcinogenesis; however, the mechanism of its efficacy is not defined. Two major biological events responsible for the clonal expansion of transformed/initiated cells into tumors are uncontrolled growth and loss of apoptotic death. Accordingly, in the present study, employing human epidermoid carcinoma A431 cells, we assessed whether alpha-santalol causes cell growth inhibition and/or cell death by apoptosis. Treatment of cells with alpha-santalol at concentrations of 25-75 microM resulted in a concentration- and a time-dependent decrease in cell number, which was largely due to cell death. Fluorescence-activated cell sorting analysis of Annexin V/propidium iodide (PI) stained cells revealed that alpha-santalol induces a strong apoptosis as early as 3 h post-treatment, which increases further in a concentration- and a time-dependent manner up to 12 h. Mechanistic studies showed an involvement of caspase-3 activation and poly(ADP-ribose) polymerase cleavage through activation of upstream caspase-8 and -9. Further, the treatment of cells with alpha-santalol also led to disruption of the mitochondrial membrane potential and cytochrome c release into the cytosol, thereby implicating the involvement of the mitochondrial pathway. Pre-treatment of cells with caspase-8 or -9 inhibitor, pan caspase inhibitor or cycloheximide totally blocked alpha-santalol-caused caspase-3 activity and cleavage, but only partially reversed apoptotic cell death. This suggests involvement of both caspase-dependent and -independent pathways, at least under caspase inhibiting conditions, in alpha-santalol-caused apoptosis. Together, this study for the first time identifies the apoptotic effect of
alpha-santalol, and defines the mechanism of apoptotic cascade activated by this agent in A431 cells, which might be contributing to its overall cancer preventive efficacy in mouse skin cancer models.

SKIN CANCER CHEMOPREVENTIVE AGENT, (ALPHA)-SANTALOL, INDUCES APOPTOTIC DEATH OF HUMAN EPIDERMAL CARCINOMA A431 CELLS VIA CASPASE ACTIVATION TOGETHER WITH DISSIPATION OF MITOCHONDRIAL MEMBRANE POTENTIAL AND CYTOCHROME C RELEASE.


α-Santalol, a derivative of sandalwood oil, induces apoptosis in human prostate cancer cells

The anticancer effects of α-santalol, a major component of sandalwood oil, have been reported against the development of certain cancers such as skin cancer both in vitro and in vivo. The primary objectives of the current study were to investigate the cancer preventive properties of α-santalol on human prostate cancer cells PC-3 (androgen independent and P-53 null) and LNCaP (androgen dependent and P-53 wild-type), and determine the possible mechanisms of its action. The effect of α-santalol on cell viability was determined by trypan blue dye exclusion assay. Apoptosis induction was confirmed by analysis of cytoplasmic histone-associated DNA fragmentation using both an apoptotic ELISA kit and a DAPI fluorescence assay. Caspase-3 activity was determined using caspase-3 (active) ELISA kit. PARP cleavage was analyzed using immunoblotting. α-Santalol at 25-75 µM decreased cell viability in both cell lines in a concentration and time dependent manner. Treatment of prostate cancer cells with α-santalol resulted in induction of apoptosis as evidenced by DNA fragmentation and nuclear staining of apoptotic cells by DAPI. α-Santalol treatment also resulted in activation of caspase-3 activity and PARP cleavage. The α-santalol-induced apoptotic cell death and activation of caspase-3 was significantly attenuated in the presence of pharmacological inhibitors of caspase-8 and caspase-9. In conclusion, the present study reveals the apoptotic effects of α-santalol in inhibiting the growth of human prostate cancer cells.

A-SANTALOL, A DERIVATIVE OF SANDALWOOD OIL, INDUCES APOPTOSIS IN HUMAN PROSTATE CANCER CELLS BY CAUSING CASPASE-3 ACTIVATION.

Marjoram

Antimutagenic Effect of Origanum majorana L. Essential Oil

This study aimed to investigate the genotoxic and cytotoxic potential of prallethrin in rat bone marrow cells and the protective effect of Origanum majorana L. essential oil (EO). Our results demonstrated that prallethrin at dose 64.0 mg/kg body weight (b.wt.), (1/10 LD50) has a clastogenic/genotoxic potential as shown by the high percentage of chromosomal aberration (CA) and micronucleus (MN) in the bone marrow cells of male rats, whereas the combined treatment of prallethrin and O. majorana EO resulted in the reduction of the CA (54.54%). The combined treatment also reduced the micronuclei formation significantly. In conclusion, prallethrin can be considered clastogenic/genotoxic and may carry a risk to human health. The study revealed the antigenotoxic and anticytotoxic potential of O. majorana EO against prallethrin-induced genotoxic and cytotoxic effects in rat bone marrow cells.

ANTIMUTAGENIC EFFECT OF ORIGANUM MAJORANA L. ESSENTIAL OIL AGAINST PRALLETHRIN-INDUCED GENOTOXIC DAMAGE IN RAT BONE MARROW CELLS.


Aromatherapy massage on the abdomen for alleviating menstrual pain in high school girls

Geranium 4956292 300x200 Aromatherapy massage on the abdomen for alleviating menstrual pain in high school girls
Geranium, Pelargonium graveolens
This study investigated the alleviating effects of aromatherapy massage and acetaminophen on menstrual pain in Korean high school girls. Subjects were divided into two groups: the aromatherapy massage (treatment) group (n = 32) and the acetaminophen (control) group (n = 23). Aromatherapy massage was performed on subjects in the treatment group. The abdomen was massaged once using clary sage, marjoram, cinnamon, ginger, and geranium in a base of almond oil. The level of menstrual pain was assessed using a visual analogue scale at baseline and twenty-four hours afterward. The reduction of menstrual pain was significantly higher in the aromatherapy group than in the
acetaminophen group. Using multiple regression, aromatherapy massage was found to be more highly associated with reduction in the level of menstrual pain than acetaminophen. These findings suggest that aromatherapy massage may be an effective treatment for menstrual pain in high school girls. However, it could not be verified whether the positive effects derived from the aromatherapy, the massage, or both. Further rigorous studies should be conducted using more objective measures.

AROMATHERAPY MASSAGE ON THE ABDOMEN FOR ALLEVIATING MENSTRUAL PAIN IN HIGH SCHOOL GIRLS: A PRELIMINARY CONTROLLED CLINICAL STUDY.


Free radical scavenging and antiacetylcholinesterase activities of Origanum majorana L. essential oil

In the present study, Origanum majorana L. essential oil (EO) was analyzed by gas chromatography-mass spectrometry (GC-MS) and evaluated for free radical scavenging and anticholinesterase activities. GC-MS analysis revealed the presence of 4-terpineol (29.97%), γ-terpinene (15.40%), trans-sabinene hydrate (10.93), α-terpinene (6.86%), 3-cyclohexene-1-1 methanal,a,a4-trimethyl-(S)-(CAS) (6.54%), and sabinene (3.91%) as main constituents. Origanum majorana L. EO exhibited concentration-dependent inhibitory effects on 2,2'-diphenylpicrylhydrazyl (DPPH(•)), hydroxyl radical, hydrogen peroxide, reducing power, and lipid peroxidation with IC(50) values of 58.67, 67.11, 91.25, 78.67, and 68.75 µg/mL, respectively; while the IC(50) values for the standard trolox were noted to be 23.95, 44.97, 51.30, 42.22, and 52.72 µg/mL, respectively. Interestingly, cholinesterase inhibitory activity was also found with IC(50) values of 36.40 µg/mL. We can conclude that the marjoram EO has a significant potential to be used as a natural antioxidant and anti-AChE.

FREE RADICAL SCAVENGING AND ANTIACETYLCHOLINESTERASE ACTIVITIES OF ORIGANUM MAJORANA L. ESSENTIAL OIL.

Melissa officinalis L. (Lamiaceae) had been reported in traditional Moroccan medicine to exhibit calming, antispasmodic, and strengthening heart effects. Therefore, this study is aimed at determining the anti-inflammatory activities of M. officinalis L. leaves. The effect of the essential oil of the leaves of this plant was investigated for anti-inflammatory properties by using carrageenan and experimental trauma-induced hind paw edema in rats. The essential oil extracted from leaves by hydrodistillation was characterized by means of gas chromatography-mass spectrometry (GC-MS). M. officinalis contained Nerol (30.44%), Citral (27.03%), Isopulegol (22.02%), Caryophyllene (2.29%), Caryophyllene oxide (1.24%), and Citronella (1.06%). Anti-inflammatory properties of oral administration of essential oil at the doses of 200, 400 mg/kg p.o., respectively, showed significant reduction and inhibition of edema with 61.76% and 70.58%, respectively, (P < 0.001) induced by carrageenan at 6 h when compared with control and standard drug (Indomethacin). On experimental trauma, M. officinalis L. essential oil showed pronounced reduction and inhibition of edema induced by carrageenan at 6 h at 200 and 400 mg/kg with 91.66% and 94.44%, respectively (P < 0.001). We can conclude that the essential oil of M. officinalis L. possesses potential anti-inflammatory activities, supporting the traditional application of this plant in treating various diseases associated with inflammation and pain.

IN VIVO POTENTIAL ANTI-INFLAMMATORY ACTIVITY OF MELISSA OFFICINALIS L. ESSENTIAL OIL.

Adv Pharmacol Sci. 2013;2013:101759. doi: 10.1155/2013/101759. Epub 2013 Dec 5. Bounihi A1, Hajjaj G1, Alnamer R2, Cherrah Y1, Zellou A. Laboratory of Pharmacology and Toxicology, Department of Drugs Sciences, Faculty of Medicine and Pharmacy, Mohammed V Souissi University, Rabat Instituts, BP 6203, Agdal, Rabat, Morocco. Laboratory of Pharmacology and Toxicology, Department of Drugs Sciences, Faculty of Medicine and Pharmacy, Mohammed V Souissi University, Rabat Instituts, BP 6203, Agdal, Rabat, Morocco ; Laboratory of Biochemistry and Immunology, Department of Biology, Faculty of Science, Mohammed V Agdal University, Rabat Instituts, BP 6203, Agdal, Rabat, Morocco ; Departement of Pharmacology, University of Thamar, BP 87246, Thamar, Yemen.
Neuroprotective properties of Melissa officinalis after hypoxic-ischemic injury

BACKGROUND: Brain ischemia initiates several metabolic events leading to neuronal death. These events mediate large amount of damage that arises after some neurodegenerative disorders as well as transient brain ischemia. Melissa officinalis is considered as a helpful herbal plant in the prevention of various neurological diseases like Alzheimer that is related with oxidative stress.

METHODS: We examined the effect of Melissa officinalis on hypoxia induced neuronal death in a cortical neuronal culture system as in vitro model and transient hippocampal ischemia as in vivo model. Transient hippocampal ischemia was induced in male rats by tow vessel-occlusion for 20 min. After reperfusion, the histopathological changes and the levels inflammation, oxidative stress status, and caspase-3 activity in hippocampus were measured.

RESULTS: Cytotoxicity assays showed a significant protection of a 10 µg/ml dose of Melissa against hypoxia in cultured neurons which was confirmed by a conventional staining (P<0.05). Melissa treatment decrease caspase3 activity (P<0.05) and TUNEL-positive cells significantly (P<0.01). Melissa oil has also inhibited malon dialdehyde level and attenuated decrease of Antioxidant Capacity in the hippocampus. Pro-inflammatory cytokines TNF-α, IL-1β and HIF-1α mRNA levels were highly increased after ischemia and treatment with Melissa significantly suppressed HIF-1α gene expression (P<0.05).

DISCUSSION: Results showed that Melissa officinalis could be considered as a protective agent in various neurological diseases associated with ischemic brain injury.

Antimicrobial and antioxidant activities of Melissa officinalis essential oil

The present study describes antimicrobial and free radical scavenging capacity (RSC) together with the effects on lipid peroxidation (LP) of Melissa officinalis essential oil. The chemical profile of essential oil was evaluated by the means of gas chromatography-mass spectrometry (GC-MS) and thin-layer chromatography (TLC). RSC was assessed measuring the scavenging activity of essential oil on the 2,2-diphenyl-1-picrylhydrazyl (DPPH(*)) and OH(*) radicals. The effect on LP was evaluated following the activities on Fe(2+)/ascorbate and
Fe(2+)/H(2)O(2) systems of induction. The antimicrobial activity was tested against 13 bacterial strains and six fungi. The examined essential oil exhibited very strong RSC, reducing the DPPH radical formation (IC(50) = 7.58 microg/mL) and OH radical generation (IC(50) = 1.74 microg/mL) in a dose-dependent manner. According to the GC-MS and TLC (dot-blot techniques), the most powerful scavenging compounds were monoterpene aldehydes and ketones (neral/geranial, citronellal, isomenthone, and menthone) and mono- and sesquiterpene hydrocarbons (E-caryophyllene). Very strong inhibition of LP, particularly in the Fe(2+)/H(2)O(2) system of induction (94.59% for 2.13 microg/mL), was observed in both cases, also in a dose-dependent manner. The most effective antibacterial activity was expressed on a multiresistant strain of Shigella sonei. A significant rate of antifungal activity was exhibited on Trichophyton species.

ANTIMICROBIAL AND ANTIOXIDANT ACTIVITIES OF MELISSA OFFICINALIS L. (LAMIACEAE) ESSENTIAL OIL.


Osmanthus

Antioxidant activity and melanogenesis inhibitory effect of the acetonic extract of Osmanthus fragrans

Osmanthus fragrans, a common flavor additive for tea and other beverages, has potential applications in biomedical science. In this study, we investigated O. fragrans acetonic extract (OFE) for its total phenolic and flavonoid contents, radical-scavenging activity, and potential anti-tyrosinase ability. OFE possessed considerable amounts of phenolics (264.7 mg gallic acid equivalent/g of extract) and flavonoids (190.7 mg catechin equivalent/g of extract). The antioxidation activities, measured in terms of EC50 values using DPPH Antioxidant activity and melanogenesis inhibitory effect of the acetonic extract of Osmanthus fragrans and ABTS Antioxidant activity and melanogenesis inhibitory effect of the acetonic extract of Osmanthus fragrans+ assays, were 304.9 mg ascorbic acid equivalent/g of extract and 516.3 mg trolox equivalent/g of extract, respectively. LC–MS results discovered the presence of luteolin in the extract, and a kinetic study revealed an uncompetitive inhibitory effect of OFE upon the oxidation of tyrosine (IC50 = 2.314 mg/mL) and l-DOPA (IC50 = 44.20 mg/mL). In addition, we tested OFE in vitro (B16F10 cells) for its anti-tyrosinase activity and anti-melanin formation and found that OFE was able to reduce the tyrosinase activity and melanin formation of B16F10 cells in a dose-dependent manner. Our findings support that O. fragrans is a potential natural, functional antioxidant food favor additive. Additionally, because OFE inhibits melanin formation, it appears to
have potential use as an anti-browning food additive, in skin-whitening cosmetics, or as a new drug for treating melanoma.

ANTIOXIDANT ACTIVITY AND MELANOGENESIS INHIBITORY EFFECT OF THE ACETONIC EXTRACT OF OSMANTHUS FRAGRANS: A POTENTIAL NATURAL AND FUNCTIONAL FOOD FLAVOR ADDITIVE

Li-chen Wu, Li-Hui Chang, Si-Han Chen, Nien-chu Fan, Ja-an Annie Ho. Food Sci and Tech. 2009; 42:1513-19. Department of Applied Chemistry, National Chi Nan University, Puli, Nantou 545, Taiwan. Graduate Institute of Biomedicine and Biomedical Technology, National Chi Nan University, Puli, Nantou 545, Taiwan. Department of Chemistry, BioAnalytical Laboratory, National Tseng-Hua University, Hsinchu 300, Taiwan

Digestion

DigestZen
This blend may be useful for improving digestive function. The oils in this blend have been studied for their abilities in balancing the digestive system and in soothing many of that system’s ailments.

Single oils contained in this blend

Ginger
Is warming, uplifting, and empowering, emotionally, it may help influence physical energy, love, and courage. Because of its calming influence on the digestive system, it may help reduce feelings of nausea and motion sickness.

Peppermint
Is an anti-inflammatory to the prostate and nerves. It is soothing, cooling, and dilating to the system. It may also be beneficial for counteracting food poisoning, vomiting, diarrhea, constipation, flatulence, halitosis, colic, nausea, and motion sickness.

Tarragon
May help to reduce anorexia, dyspepsia, flatulence, intestinal spasms, nervous and sluggish digestion, and genital urinary tract infection.

Fennel
May help improve digestive function by supporting the liver. It may also help balance the hormones.
Caraway
Is antiphrastic and antispasmodic. It may also help with indigestion, gas, and colic.

Coriander
Is antispasmodic and has anti-inflammatory properties. It may also help with indigestion, in flatulence, diarrhea, and other spasms of the digestive tract.

Anise
May help calm and strengthen the digestive system

Common Primary uses
Bloating, colitis, constipation, cramps (abdominal) chrohn’s disease, diarrhea, food poisoning, gastritis, heartburn, nausea, parasites, and sinusitis.

Body systems affected
The oils in this blend may help it be effective for dealing with various problems related to the digestive system

Peppermint
Properties
Analgesic, antibacterial, anticarcinogenic, anti-inflammatory, Antiviral, and invigorating.

Common Primary uses
Alertness, antioxidant, asthma, autism, bacterial, infections, bell’s palsy, Brian injury, chronic fatigue, cold sores, colon polyps, congestion, constipation, cooling (body), cramps/charley horses, crohns disease, diarrhea, dysmenorrheal, endurance, fainting, fever, flu (influenza), gamma radiation exposure, gastric, halitosis, headaches, heartburn, heatstroke, hernia (hiatal), herpes simplex, hives, hot flashes, Huntington’s disease, hypothyroidism, indigestion, irritable bowel syndrome, itching, jet lag, lactation (decrease in milk production), memory migraines, motion sickness, MRSA, multiple sclerosis, muscle aches, muscle fatigue, myelin sheath, nausea, olfactory loss (sense of smell), osteoporosis, paralysis, rhinitis, scabies, sciatica, shock, sinusitis, surgical wounds, swollen eyes, tennis elbow, throat infection, typhoid, ulcer (gastric), varicose veins, vomiting

Historical uses
For centuries, peppermint has been used to soothe digestive difficulties, freshen breath, and to relieve colic, gas headaches, heartburn, and indigestion

Other possible uses
This oil may help anger, arthritis, colic. Depression, fatigue, food poisoning, hysteria, inflammation, liver problems, nerves (regenerate and support), rheumatism, elevate and open sensory system, soothe and cool skin (may help keep body cooler hot days), toothaches, tuberculosis, and add flavor to water.

Body systems affected
Digestive system, muscles and bones, nervous and respiratory systems, skin.
**Aromatic influence**
It is purifying and stimulating to the conscious mind and may aid with memory and mental performance. It is cooling and may help reduce fevers.

**Ginger**
**Properties**
Antiseptic, laxative, stimulant, tonic, and warming

**Common primary uses**
Angina, club foot, diarrhea, gas/flatulence, indigestion, libido (low), morning sickness, nausea, pelvic pain syndrome, rheumatic fever (pain), rheumatoid arthritis, scurvy, vertigo, vomiting

**Other possible uses**
Ginger may be used for alcoholism, loss of appetite, arthritis, broken bones, catarrh (mucus), chills, colds, colic, congestion, coughs, cramps, digestive disorders, fevers, flu, impotence, indigestion, infectious diseases, memory, motion sickness, musculature aches/pains, rheumatism, sinusitis, sore throats, and sprains, Ginger may also be used in cooking

**Body systems affected**
Digestive and nervous systems

**Aromatic influence**
The aroma may help influence physical energy, love, money, and courage.

**Lemon**
**Properties**
Anticancer, antidepressant, antiseptic, antifungal, antioxidant, antiviral, astringent, invigorating, refreshing, and tonic.

**Common primary uses**
Air pollutions, anxiety, atherosclerosis, bites/stings, blood pressure (regulation), brain injury, cold sores, colds (common), concentration, constipation, depression, digestion (sluggish), disinfectant, dry throat, dysentery, energizing, exhaustion, fever, flu (influenza), furniture polish, gout, greasy/oily hair, grief/sorrow, gum/grease removal, hangovers, heartburn, intestinal parasites, kidney stones, lymphatic cleansing, MRSA, overeating, pancreatitis, physical energy, postpartum depression, purification, relaxation, skin (tones), stress, throat infection, tonsillitis, uplifting, varicose veins, water veins, water purification.

**Other possible uses**
This oil may help with circulation, improving digestion, improving eyesight, fevers, flatulence, headaches, clearing infections, repairing ligaments, waking up the lymphatic system, getting the oxygen flowing, respiratory problems, sore throats, tissue regeneration, and water retention.

**Body systems affected**
Immune system, muscles and bones

**Aromatic influence**
It promotes awareness and purification
The effect of fennel seed oil emulsion in infantile colic

Despite its benign, natural course, colic is a significant problem in infants and imparts a psychological, emotional, and physical burden to parents. Dicyclomine hydrochloride is the only pharmacological treatment for infantile colic that has been consistently effective. Unfortunately, 5% of infants treated with dicyclomine hydrochloride develop serious side effects, including death. Fennel seed oil has been shown to reduce intestinal spasms and increase motility of the small intestine. However, there have not been any clinical studies of its effectiveness.

To determine the effectiveness of fennel seed oil emulsion in infantile colic, a randomized placebo-controlled trial was done in two large multi-specialty clinics, with 125 infants, 2 to 12 weeks of age, who met the definition of colic. Material used included a fennel seed oil emulsion compared with placebo.

OUTCOME MEASURE: Relief of colic symptoms, which was defined as decrease of cumulative crying to less than 9 hours per week.

RESULTS: The use of fennel oil emulsion eliminated colic, according to the Wessel criteria, in 65% (40/62) of infants in the treatment group, which was significantly better than 23.7% (14/59) of infants in the control group (P < 0.01). There was a significant improvement of colic in the treatment group compared with the control group [Absolute Risk Reduction (ARR) = 41% (95% CI 25 to 57), Number Needed to Treat (NNT) = 2 (95% CI 2 to 4)]. Side effects were not reported for infants in either group during the trial.

CONCLUSION: Our study suggests that fennel seed oil emulsion is superior to placebo in decreasing intensity of infantile colic.

THE EFFECT OF FENNEL (FOENICULUM VULGARE) SEED OIL EMULSION IN INFANTILE COLIC: A RANDOMIZED, PLACEBO-CONTROLLED STUDY.


The effect of fennel essential oil on uterine contraction

Increasing the ectopic uterine motility is the major reason for primary dysmenorrhea. This motility is the basis for several symptoms including for pain is the main complaints of patients with primary dysmenorrhea. There are several
mechanisms, which initiate dysmenorrhea. Therefore, different compounds can be employed to control its symptoms. In long-term therapy, combination of oestrogens and progestins may be useful. In short-term therapy, dysmenorrhea sometimes non-steroidal anti-inflammatory drugs (NSAIDs) are used. Most of NSAIDs in long-term therapy show severe adverse effects. In an attempt to find agents with less adverse effect the fennel essential oil (FEO) was chosen for this investigation. In this article, effects of FEO on the uterine contraction and estimation of LD(50) in rat were described. For assessment of pharmacological effects on the isolated rat uterus, oxytocin (0.1, 1 and 10 μ/ml) and prostaglandin E(2) (PGE(2)) (5×10(-5) M) were employed to induce muscle contraction. Administration of different doses of FEO reduced the intensity of oxytocin and PGE(2) induced contractions significantly (25 and 50 microg/ml for oxytocin and 10 and 20 microg/ml PGE(2), respectively). FEO also reduced the frequency of contractions induced by PGE(2) but not with oxytocin. LD(50) of FEO was obtained in the female rats by using moving average method. The estimated LD(50) was 1326 mg/kg. No obvious damage was observed in the vital organs of the dead animals.

THE EFFECT OF FENNEL ESSENTIAL OIL ON UTERINE CONTRACTION AS A MODEL FOR DYSMENORRHEA, PHARMACOLOGY AND TOXICOLOGY STUDY.

J Ethnopharmacol. 2001 Aug;76(3):299-304. Ostad SN, Soodi M, Shariffzadeh M, Khorshidi N, Marzban H. Department of Toxicology and Pharmacology, Faculty of Pharmacy, University of Tehran Medical Sciences, PO Box 14155/6451, Tehran, Iran.

Antioxidant and anticarcinogenic effects of methanolic extract and volatile oil of fennel seeds

The present study evaluated the efficacy of fennel seed methanolic extract (FSME) for its antioxidant, cytotoxic, and antitumor activities and for its capacity to serve as a nontoxic radioprotector in Swiss albino mice. We also assessed the natural antioxidant compounds of FSME for use in industrial application. Cytotoxic activity of FSME was evaluated in a mouse model of Ehrlich ascites carcinoma (EAC) and on different types of human cell lines in vitro. The safety and optimum dose of FSME were determined. FSME, 100 mg/kg, was injected intraperitoneally into mice bearing EAC before the mice were exposed to three 2-Gy doses of gamma irradiation. After 30 days, mice were fasted for 18 hours and then sacrificed to observe the lifespan of EAC-bearing hosts. Malondialdehyde (MDA), catalase activity, glutathione content, and total protein in serum, liver tissue, and ascitic fluid were determined. Iron, total iron-binding capacity, transferrin, and ferritin were also evaluated in serum. The data showed the presence of different types of compounds in FSME, such as flavonoids, terpenoids, alkaloids, phenols, and sterols; estragole (71.099%) was the
predominant alcohol, gallic acid was the phenolic compound (18.895%), and L-limonene was the most prevalent monoterpene hydrocarbon (11.967%). The mean±standard deviation 50% inhibitory concentrations were 50±0.03 µg/mL for the MCF7 breast cancer cell line and 48±022 µg/mL for the Hepg-2 liver cancer cell line. The significant increase in MDA levels and the significant decrease in catalase activity and glutathione content in liver and tumor tissue in mice bearing EAC were ameliorated after FSME administration. In contrast, total protein content was increased in ascitic fluid. Serum iron was inversely proportional to the levels of ferritin and transferrin and total iron-binding capacity. Administration of FSME before irradiation exerted a cytoprotective effect against gamma irradiation, as manifested by a restoration of the MDA level, catalase activity, and GSH content to near-normal levels. In conclusion, FSME may have remarkable anticancer potential against a breast cancer cell line (MCF7) and liver cancer cell line (Hepg-2). It also showed strong free radical-scavenging activity (100%). Thus, FSME may reduce oxidative stress and protect mouse cells from damage caused by reactive oxygen species. In addition, it could be used as a safe, effective, and easily accessible source of natural antioxidants to improve the oxidative stability of fatty foods during storage. FSME also exhibited an antitumor effect by modulating lipid peroxidation and augmenting the antioxidant defense system in EAC-bearing mice with or without exposure to radiation.

ANTIOXIDANT AND ANTICARCINOGENIC EFFECTS OF METHANOLIC EXTRACT AND VOLATILE OIL OF FENNEL SEEDS (FOENICULUM VULGARE).


The effectiveness of massage with aromatic ginger and orange essential oil for knee pain among the elderly

OBJECTIVES: To assess the efficacy of an aromatic essential oil (1% Zingiber officinale and 0.5% Citrus sinensis) massage among the elderly with moderate-to-severe knee pain.

METHOD: Fifty-nine older persons were enrolled in a double-blind, placebo-controlled experimental study group from the Community Centre for Senior Citizens, Hong Kong. The intervention was six massage sessions with ginger and orange oil over a 3-week period. The placebo control group received the same massage intervention with olive oil only and the control group received no massage. Assessment was done at baseline, post 1-week and post 4 weeks after treatment. Changes from baseline to the end of treatment were assessed on knee pain intensity, stiffness level and physical functioning (by Western
Ontario and McMaster Universities Osteoarthritis index) and quality of life (by SF-36).

RESULTS: There were significant mean changes between the three time-points within the intervention group on three of the outcome measures: knee pain intensity (p=0.02); stiffness level (p=0.03); and enhancing physical function (p=0.04) but these were not apparent with the between-groups comparison (p=0.48, 0.14 and 0.45 respectively) 4 weeks after the massage. The improvement of physical function and pain were superior in the intervention group compared with both the placebo and the control group at post 1-week time (both p=0.03) but not sustained at post 4 weeks (p=0.45 and 0.29). The changes in quality of life were not statistically significant for all three groups.

CONCLUSION: The aroma-massage therapy seems to have potential as an alternative method for short-term knee pain relief.

AN EXPERIMENTAL STUDY ON THE EFFECTIVENESS OF MASSAGE WITH AROMATIC GINGER AND ORANGE ESSENTIAL OIL FOR MODERATE-TO-SEVERE KNEE PAIN AMONG THE ELDERLY IN HONG KONG.


Antioxidant, anti-inflammatory and antinociceptive activities of essential oil from ginger

Chemical compositions of ginger oil as well as its antioxidant, anti-inflammatory and antinociceptive potential were evaluated in the present study. The main constituents as detected by GC/MS analysis was alpha-zingiberene which constituted 31% of the total area, ar-curcumene (15.4%) and a -sesquiphellandrene (14.02%). Ginger oil scavenged superoxide, DPPH, hydroxyl radicals and inhibited tissue lipid peroxidation in vitro. Intraperitoneal administration of ginger oil was found to inhibit phorbol-12-myristate-13-acetate induced superoxide radicals elicited by macrophages. Oral administration of ginger oil for one month, significantly increased superoxide dismutase, glutathione and glutathione reductase enzymes level (P < 0.001) in blood of mice and glutathione-S-transferase, glutathione peroxidase and superoxide dismutase enzymes in liver. Ginger oil produced significant reduction in acute inflammation produced by carrageenan and dextran and formalin induced chronic inflammation (P < 0.001). It also exhibited significant reduction in acetic acid induced writhing movements (P < 0.001). The present report revealed that ginger oil possesses antioxidant activity as well as significant anti-inflammatory and antinociceptive property.
**Aromatherapy as Treatment for Postoperative Nausea**

Background: Postoperative nausea (PON) is a common complication of anesthesia and surgery. Antiemetic medication for higher-risk patients may reduce but does not reliably prevent PON. We examined aromatherapy as a treatment for patients experiencing PON after ambulatory surgery. Our primary hypothesis was that in comparison with inhaling a placebo, PON will be reduced significantly by aromatherapy with (1) essential oil of ginger, (2) a blend of essential oils of ginger, spearmint, peppermint, and cardamom, or (3) isopropyl alcohol. Our secondary hypothesis was that the effectiveness of aromatherapy will depend upon the agent used.

Methods: A randomized trial of aromatherapy with patients who reported nausea in the postanesthesia care unit was conducted at one ambulatory surgical center. Eligibility criteria were adult, able to give consent, and no history of coagulation problems or allergy to the aromatherapy agents. Before surgery, demographic and risk factors were collected. Patients with a nausea level of 1 to 3 on a verbal descriptive scale (0-3) received a gauze pad saturated with a randomly chosen aromatherapy agent and were told to inhale deeply 3 times; nausea (0-3) was then measured again in 5 minutes. Prophylactic and postnausea antiemetics were given as ordered by physicians or as requested by the patient.

Results: A total of 1151 subjects were screened for inclusion; 303 subjects reporting nausea were enrolled (26.3%), and 301 meeting protocol were analyzed (26.2%). The change in nausea level was significant for the blend (P < 0.001) and ginger (P = 0.002) versus saline but not for alcohol (P < 0.76). The number of antiemetic medications requested after aromatherapy was also significantly reduced with ginger or blend aromatherapy versus saline (P = 0.002 and P < 0.001, respectively).

Conclusion: The hypothesis that aromatherapy would be effective as a treatment for PON was supported. On the basis of our results, future research further evaluating aromatherapy is warranted. Aromatherapy is promising as an inexpensive, noninvasive treatment for PON that can be administered and controlled by patients as needed.

AROMATHERAPY AS TREATMENT FOR POSTOPERATIVE NAUSEA: A RANDOMIZED TRIAL.
Antiinflammatory effects of ginger and some of its components in human bronchial epithelial cells

The proinflammatory chemokine interleukin-8 is increased in asthmatic patients. Traditionally, ginger is used as an antiinflammatory drug. An extract and several compounds of Zingiber officinale (ginger) were tested in human bronchial epithelial cells (BEAS-2B cells) with respect to their effect on lipopolysaccharide (LPS)-induced secretion of the proinflammatory chemokine interleukin 8 (IL-8) and RANTES (regulated upon activation, normal T-cell expressed and secreted). An oily extract of ginger rhizome with > 25% total pungent compounds, ginger volatile oil, ar-curcumene and α-pinene reduced the LPS-induced IL-8 secretion (measured by a specific enzyme-linked immunosorbent assay), whereas a spissum extract, the pungents [6]-gingerol and its metabolite [6]-shogaol, and the terpenoids citral and β-phellandrene showed no effect. The LPS-induced slight increase of RANTES was reduced by volatile oil, ar-curcumene and α-pinene. There was no effect of LPS on TNF-α. Our results suggest that distinct ginger compounds could be used as antiinflammatory drugs in respiratory infections.

CONTRIBUTION OF ANTERIOR CINGULATE CORTEX AND DESCENDING PAIN INHIBITORY SYSTEM TO ANALGESIC EFFECT OF LEMON ODOR

BACKGROUND: Affections are thought to regulate pain perception through the descending pain inhibitory system in the central nervous system. In this study, we examined in mice the affective change by inhalation of the lemon oil, which is well used for aromatherapy, and the effect of lemon odor on pain sensation. We also examined the anterior cingulate cortex (ACC) and descending pain inhibitory system to such regulation of pain.

RESULTS: In the elevated plus maze, the time spent in the open arms was increased by inhalation of lemon oil. The pain behavior induced by injection of formalin into the hind paw was decreased. By inhalation of lemon oil, the number of c-Fos expression by formalin injection was significantly increased in the ACC,
periaqueductal grey (PAG), nucleus raphe magnus (NRM) and locus ceruleus, and decreased in the spinal dorsal horn (SDH). The destruction of the ACC with ibotenic acid led to prevent the decrease of formalin-evoked nocifensive behavior in mice exposed to lemon oil. In these mice, the change of formalin-induced c-Fos expression in the ACC, lateral PAG, NRM and SDH by lemon odor was also prevented. Antagonize of dopamine D1 receptor in the ACC prevented to the analgesic effect of lemon oil.

CONCLUSIONS: These results suggest that the analgesic effect of lemon oil is induced by dopamine-related activation of ACC and the descending pain inhibitory system.

CONTRIBUTION OF ANTERIOR CINGULATE CORTEX AND DESCENDING PAIN INHIBITORY SYSTEM TO ANALGESIC EFFECT OF LEMON ODOR IN MICE.


**Induction of apoptosis by D-limonene in human colon cancer cells**

D-limonene is recognized as a potential chemotherapeutic agent, however, the details of this mechanism remain unclear. In this study, we investigated the effects of d-limonene on colon cancer cell viability and its potential mechanism of action in vitro. After 48 h of treatment, d-limonene suppressed the viability of LS174T cells in a dose-dependent manner and caused a dose-dependent apoptotic cell death. D-limonene activated caspase-3 and -9 and PARP cleavage in a dose-dependent manner. Moreover, an increase in Bax protein and cytosol cytochrome c from mitochondria and a decrease in bcl-2 protein were observed following treatment with d-limonene. In addition, d-limonene decreased the levels of p-Akt (Ser473), p-Akt (Thr308) and p-GSK-3β (Ser9), suggesting that d-limonene induced apoptosis via the mitochondrial death pathway and the suppression of the PI3K/Akt pathway.

INDUCTION OF APOPTOSIS BY D-LIMONENE IS MEDIATED BY INACTIVATION OF AKT IN LS174T HUMAN COLON CANCER CELLS.

Effects of the essential oil from citrus lemon in male and female rats exposed to a persistent painful stimulation

The ability of olfaction to modulate behavior in mammalian species has repeatedly been demonstrated. Here we tested the properties of the volatile components of lemon essential oil. Male and female rats were allowed to inhale the aroma while experiencing a persistent nociceptive input (50 microl formalin, 5%); in the same animals the c-Fos immunohistochemistry was used to test the degree of neuronal activation of areas belonging to the limbic system. In formalin-treated animals, lemon essential oil decreased licking the injected paw, in both sexes; flinching and flexing were decreased in males and increased in females in the interphase (5-20 min) of the formalin test. Essential oil increased the c-Fos expression in the arcuate n. of the hypothalamus. Essential oil and formalin increased c-Fos in the paraventricular n. of the hypothalamus and in the dentate gyrus of the hippocampus. In the paraventricular n. of the thalamus formalin induced higher c-Fos than control in both sexes; when formalin treatment was carried out in presence of essential oil, c-Fos further increased in males, but remained at control levels in females. The present results clearly indicate the ability of lemon essential oil to modulate the behavioral and neuronal responses related to nociception and pain.

EFFECTS OF THE ESSENTIAL OIL FROM CITRUS LEMON IN MALE AND FEMALE RATS EXPOSED TO A PERSISTENT PAINFUL STIMULATION.

Behav Brain Res. 2002 Oct 17;136(1):127-35. Aloisi AM, Ceccarelli I, Masi F, Scaramuzzino A. Department of Physiology, University of Siena, via Aldo Moro, Italy.

Oral administration of d-Limonene controls inflammation in rat colitis and displays anti-inflammatory properties

AIMS: To further explore the anti-inflammatory properties of d-Limonene.

MAIN METHODS: A rat model was used to compare evolution of TNBS (2,5,6-trinitrobenzene sulfonic acid)-induced colitis after oral feeding with d-Limonene compared to ibuprofen. Peripheral levels of TNF-α (Tumor Necrosis Factor alpha) were assessed in all animals. Cell cultures of fibroblasts and enterocytes were used to test the effect of d-Limonene respectively on TNFa-induced NF-κB (nuclear factor-kappa B) translocation and epithelial resistance. Finally, plasmatic inflammatory markers were examined in an observational study of diet supplementation with d-Limonene-containing orange peel extract (OPE) in humans.

KEY FINDINGS: Administered per os at a dose of 10mg/kg p.o., d-Limonene induced a significant reduction of intestinal inflammatory scores, comparable to
that induced by ibuprofen. Moreover, d-Limonene-fed rats had significantly lowered serum concentrations of TNF-α compared to untreated TNBS-colitis rats. The anti-inflammatory effect of d-Limonene also involved inhibition of TNFα-induced NF-κB translocation in fibroblast cultures. The application of d-Limonene on colonic HT-29/B6 cell monolayers increased epithelial resistance. Finally, inflammatory markers, especially peripheral IL-6, markedly decreased upon OPE supplementation of elderly healthy subjects submitted or not to 56 days of dietary supplementation with OPE.

SIGNIFICANCE: In conclusion, d-Limonene indeed demonstrates significant anti-inflammatory effects both in vivo and in vitro. Protective effects on the epithelial barrier and decreased cytokines are involved, suggesting a beneficial role of d-Limonene as diet supplement in reducing inflammation.

ORAL ADMINISTRATION OF D-LIMONENE CONTROLS INFLAMMATION IN RAT COLITIS AND DISPLAYS ANTI-INFLAMMATORY PROPERTIES AS DIET SUPPLEMENTATION IN HUMANS.


Life long vitality

**Alpha CRS+**
Supports healthy cell proliferation and lifespan, mitochondrial energy production, and healthy cellular inflammatory response.
Helps reduce inflammation and supports healthy joints with boswellic acids, which have been studied for years for their strong anti-inflammatory, anti-arthritis, and anticancer properties.

**xEQ Mega**
Promotes healthy cardiovascular, immune, joint and brain health
Supports nutrient absorption in the intestinal tract
Includes essential omega fatty acids from both marine and land sources
Possesses the unique potential to cross the blood-brain barrier with the antioxidant astaxanthin, a natural carotenoid
Includes the following oils
**Balance**- for Stress management
**Frankincense**- For cellular repair
**Lemon**- for cleansing
**Onguard**- for immune support
**Serenity**- for calming/sleep
**Terrazyme**- for digestive support
**Microplex VMz**
Provides the vitamins and minerals that are often deficient in a normal diet
Optimizes nutrient absorption
Helps calm the stomach
Supports healthy cell, tissue, and system function
Fortifies the body with vitamins a, c, and e and with an energy complex of b vitamins presented in a patented glycoprotein matrix