



Essential oil used as aromatherapy

Chitra Govind Rajput

Adarsh College of Pharmacy, Vita, Maharashtra, India

Abstract

Aromatherapy is one of the complementary therapies which use essential oils as the major therapeutic agents to treat several diseases. The essential or volatile oils are extracted from the flowers, barks, stem, leaves, roots, fruits and other parts of the plant by various methods. It came into existence after the scientists deciphered the antiseptic and skin permeability properties of essential oils. Inhalation, local application and baths are the major methods used in aromatherapy that utilize these oils to penetrate the human skin surface with marked aura.

Keywords: aromatherapy, essential oils

Introduction

Aromatherapy is the therapeutic use of essential oils. Its origins can be traced back to Ancient times, when the Egyptians used aromatic substances such as frankincense and myrrh for religious and spiritual ceremonies. Aromatic herbs and oils continued to be used as healthcare throughout the ages, but it was not until the 1920s that the term aromatherapy was coined. French chemist Rene-Maurice Gattefosse burned his hands in a laboratory explosion and rinsed them with lavender essential oil. He noted that his hands burned incredibly quickly, with little scarring, and subsequently worked with several doctors to treat soldiers' wounds with essential oils. Holistic aromatherapy, as it is practised today, was largely developed by Marguerite Maury, who emphasised the importance of essential oils in massage, and as therapeutic substances capable of bringing about emotional changes. One of the most common methods of using essential oils is to incorporate them into a massage treatment. A professional aromatherapist will conduct a thorough consultation to establish medical history and current state of health, then select essential oils according to the needs of the client to create a tailor-made blend. The blend is then combined with relaxing massage to enhance and support the wellbeing of the mind, body and spirit. Essential oils may also be used in baths, creams, compresses, oil burners/diffusers, steam inhalation, body/perfume oils, aroma stick inhalers or aromatherapy jewellery. These methods are also ideal for the client to use at home to maintain the effects of aromatherapy between professional treatments. essential oils do have safety considerations and should be used with care. Some essential oils may irritate sensitive skin, some should not be used by individuals who are pregnant, have epilepsy or high/low blood pressure, and others (such as sassafras, pennyroyal and wintergreen) should never be used in aromatherapy due to their toxicity. Essential oils should never be ingested unless under the supervision of a medical professional or aromatherapist who has had suitable training in this specialist

area. Be cautious when following tips on the Internet and social media when it comes to essential oils – anyone can write about aromatherapy so it's always best to consult a qualified aromatherapist for advice before using oils at home. However, it is used, aromatherapy is a fantastic treatment that can help to optimise health and wellbeing and manage stressful lifestyles

How aromatherapy works

For centuries, the essential oils have found their importance as a fragrance with a curative potential on the body, mind and spirit. These aroma molecules are very potent organic plant chemicals that make the surroundings free from disease, bacteria, virus and fungus. Their versatile character of antibacterial, antiviral, anti-inflammatory nature along with immune booster body with hormonal, glandular, emotional, circulatory, calming effect, memory and alertness enhancer, is well documented by many scientists. Many pilot projects and studies have been conducted on humans to disorder. These oils are known for their energy specific character, as their potency is not lost with time and age. The stimulation properties of these oils lay in their structure which are closely in resemblance with actual hormones. The penetration potential of these oils to reach the subcutaneous tissues is one of the important characters of these therapy. Their effects are also complex and subtle due to their complex structure and chemical properties.

The mechanism of their action involves integration of essential oils into a biological signals of the receptor cells in the nose when inhaled. The signal is transmitted to limbic and hypothalamus parts of the brain via olfactory bulb. These signals cause brain to release neuro messengers like serotonin, endorphin etc., to link our nervous and other body systems assuring a desired change and to provide a feeling of relief. Serotonin, endorphin and noradrenalin are released from calming oil, euphoric, and stimulating oil respectively to give expected effect on mind and body.

Classification of aromatherapy

1. Cosmetic aromatherapy

This therapy utilizes certain essential oils for skin, body, face and hair cosmetic products. These products are used for their various effects as cleansing, moisturizing, drying and toning. A healthy skin can be obtained by use of essential oils in facial products. On a personal level, cosmetic aromatherapy of full-body or foot bath will be a simple and an effective way to have an experience. Similarly, few drops of appropriate oil give a rejuvenating and revitalizing experience.

2. Massage aromatherapy

The use of grape seed, almond, or jojoba oil in pure vegetable oil during massage has been shown to have wonderful effects. This is also known as healing touch of massage therapy.

3. Medical aromatherapy

The founder of modern aromatherapy Rene-Maurice Gatehouse has used essential oils to massage patients during surgery, thus utilizing the medical aromatherapy knowledge of the effect of essential oils on promoting and treating clinically diagnosed medical ailments.

4. Olfactory aromatherapy

Inhalation of essential oils has given rise to olfactory aromatherapy, where simple inhalation has resulted in enhanced emotional wellness, calmness, relaxation or rejuvenation of the human body. The release of stress is welded with pleasurable scents which unlock odor memories. Essential oils are complemented to medical treatment and can never be taken as a replacement for it.

5. Psycho-aromatherapy

In psycho-aromatherapy, certain states of moods and emotions can be obtained by these oils giving the pleasure of relaxation, invigoration or a pleasant memory. The inhalation of the oils in this therapy is direct though the infusion in the room of a patient. Psycho- aromatherapy and aroma ology, both deal with the study and effects of aroma be it natural or synthetic. Psycho-aromatherapy has limited itself with study of natural essential oils.

Essential Oil

Essential oils (EOs) are important aromatic components of herbs and spices and their biological activities have been known and utilized since ancient times in perfumery, food preservation, flavoring, and medicine.

The antimicrobial activities of essential oils clearly indicate that, they are more acceptable because of their unique antibacterial, antifungal and antiviral properties.

What are essential oils used for?

- 1. Eucalyptus oil:** nasal decongestant, disinfectant.
- 2. Clove oil:** toothaches.
- 3. Tea tree oil:** antifungal, antibacterial, antiviral properties.
- 4. Peppermint:** digestive disorders.
- 5. Lavender:** anxiety, insomnia and restlessness

Uses of Essentials Oil

1. Antibacterial

Many essential oils were screened for their antibacterial activity against Gram-positive and Gram-negative bacteria along with antifungal properties. These essential oils are well studied for their antibacterial properties and beyond doubt they have shown some very promising results on salmonella, staphylococci and other oral pathogens. It has bactericidal properties against Aero monas, Hydrophilia and Pseudomonas fluorescens.

2. Antifungal

Melaleuca alternifolia (tea tree) oil tested positive for its all constituents for *in vitro* antifungal activity except beta-myrcene. Hammer *et al.* identified that most of the components of tea tree oil had wide range of fungicidal potential, especially against dermatophytes and filamentous fungi.

3. Antiviral

antiviral activity evaluated by Deans and Ritchie for the essential oils of *M. eric folia*, *M. Leucadendron*, *M. armillarias* and *Melaleuca symphiliosis* on kidney cells of African green monkey through plaque reduction assay on herpes simplex virus type 1, gave the remarkable results for *M. armillarias* (up to 99%) followed by *Leucadendron* (92%) and *M. eric folia* (91.5%).

4. Anti-inflammatory

Histamine reaction of weal and flare were reduced by tea tree oil in human. The topical applications of 100% tea tree oil are able to reduce the inflammation induced by histamine diphosphate after a period of 10 min. Existing data on various essential oils shows that noncytotoxic concentrations exert an anti-inflammatory action by increasing interleukin-10 production.

5. Anti-tumor

Tea tree oil and terpinen-4-ol both were able to retard the growth of human melanoma M14 WT cells and M14 adriamic-inresistant cells. This action was linked to apoptosis via caspase dependent mechanism in melanoma cells. 5-Fluorouracil treatment is enhanced in human colon cancer cells if sensitized by geraniol, a component of plant essential oils.

6. Anti-oxidant

The essential oil from seeds of *Nigella sativa* L. is a potent antioxidant *in vitro*, with effective hydroxyl radical scavenging activity. Kanuka (*Kunzea ericoid*), Manuka (*Leptospermum conarium*) and *Leptospermum peperoni* possess good antibacterial activity and antioxidant properties. The essential oil from the *M. armillarias* has marked antioxidant potential; it alters the parameters of superoxide dismutase, improves vitamin E and vitamin C concentrations. The free radicals produced during inflammation, can induce gene mutations and posttranslational modifications of various proteins. If not, remove may turn injurious radicals to the whole system. This mechanism is generally countered by

antioxidant properties of compounds. Various plants like *Thymus vulgaris*, *C. lemon*, *E. globulus* and *Cupressus sempervirens* have shown them anti-inflammatory effects on animal study.

7. Insect/mosquito repellent action

Insect repellency/toxicity results were promising from the essential oils of *Nepeta Parnassian*, on the *Culex pipiens* moths.

8. Hormonal action

Geraniol, nerol, geraniol, and trans-anethole are well established for their stimulation of estrogenic response, when compared to eugenol which has anti-estrogenic activity. Citra i.e., the combination of geraniol, neroli and eugenol were effective in replacing $[3H]$ 17β - estradiol from the estrogen receptors in recombinant yeast cells.

9. Anti-dandruff

In a single blind and parallel-group study, it was observed that shampoos which contain five percent tea tree oil were effective and well tolerated by patients having mild to moderate dandruff and at least 41% improvement was observed. Not much has been explored on the antidandruff potential of plant products, and especially on volatile products, some efforts have been made by Anjum *et al.*, but the results are not promising.

Chemical Constituents of Essential Oils

Volatile: Essential oil constituting of 90–95% of the oil in weight, containing the Monoterpenes and sesquiterpene hydrocarbons, as well as their oxygenated derivatives along with aliphatic aldehydes, alcohols, and esters.

Nonvolatile: that comprises 1–10% of the oil, containing hydrocarbons, fatty acids, flavonoids.

Hydrocarbon: Essential Oils consist of Chemical Compounds that have hydrogen and carbon as their building blocks. Basic Hydrocarbon found in plants is isoprene having the following structure.

Example: (Isoprene)

1. Terpenes

Generally, have names ending in “ene.”

Forex: Limonene, Pinene, Peperin, Camphene, etc.

Terpenes are anti-inflammatory, antiseptic, antiviral, and bactericidal. Terpenes can be further categorized in Monoterpenes, sesquiterpene and diterpenes. Referring back to isoprene units under the Hydrocarbon heading, when two of these isoprene Units join head to tail, the result is a Monoterpenes, when three joins, it's a sesquiterpene and four linked isoprene units are diterpenes.

Monoterpenes $[C_{10}H_{16}]$

Properties: Analgesic, Bactericidal, Expectorant, and Stimulant.

Monoterpenes are naturally occurring compounds, the

majority being unsaturated hydrocarbons.

2. Alcohol

Properties: anti-septic, anti-viral, bactericidal and germicidal. Alcohols are the compounds which contains Hydroxyl compounds. Alcohols exist naturally, either as a free compound, or combined with a terpenes or ester. When terpenes are attached to an oxygen atom, and hydrogen atom, the result is an alcohol. When the terpene is monoterpene, the resulting alcohol is called a monoterpene.

Alcohols have a very low or totally absent toxic reaction in the body or on the skin. Therefore, they are considered safe to use.

Plants Used in Aromatherapy

1. Lemongrass

Lemongrass (*Cymbopogon citrates*, *Cymbopogon flexuosus*) oil is a type of essential oil often used in aromatherapy and by natural medicine practitioners for a variety of purposes, including reducing inflammation, relieving headaches, improving dandruff, and easing indigestion.

1. Native to islands in Southeastern Asia, lemongrass is a tall grass that grows in tropical climates. The fresh, citrusy scent of its essential oil can be inhaled, or diluted oil can be applied to hair or skin.

Botanical name

West Indian: *Cymbopogon citrates* East

Indian: *Cymbopogon flexuosus*

Lemongrass plant family: Pinaceae

Plant part typically used: Grass **color:** Pale Yellow to Vivid Yellow

Consistency: Thin

Aromatic description: Lemongrass Essential Oil smells fresh, lemony and slightly herbaceous.

Health Benefits: Inhaling the aroma of lemongrass essential oil or absorbing it through the skin is said to transmit messages to the brain's limbic system, a region that influences the nervous system.

According to aromatherapy proponents, essential oils may affect a number of biological factors, including heart rate, stress levels, blood pressure, breathing, and immune function. 2. Lemongrass essential oil is typically used for Excessive sweating, Headaches

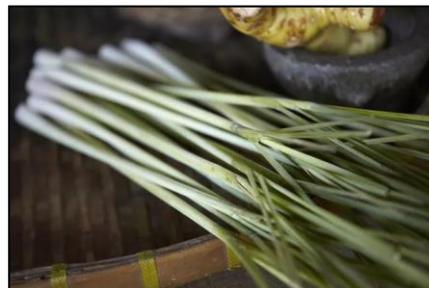


Fig 1: Lemongrass

2. Lemon

Lemon essential oil is a type of essential oil commonly used in aromatherapy. Sourced from the peel of the Citrus Limon plant, lemon essential oil is said to offer a number of health benefits. This is different from lemongrass essential oil.

Botanical name: Citrus Limon

Plant family: Rutaceous

Plant Part Typically Used: Citrus Rind (Peel) **Color:** Pale Yellow to Deep Yellow **Consistency:** Thin

Aromatic description: Lemon Essential Oil smells similar to fresh lemon rinds except that it is more concentrated.

Health benefits

The uses of lemon essential oil include easing stress, elevating mood, stimulating the immune system, alleviating pain, and promoting weight loss, Gastrointestinal Disorders, Indigestion.



Fig 2: Lemon

3. Cinnamon

The warm and spicy aroma of cinnamon is often associated with the holiday season. Once thought to be more valuable than gold, this highly versatile essential oil also offers a variety of health benefits. Cinnamon Bark Essential Oil is team distilled from the bark of the cinnamon tree. The bark oil is generally preferred over Cinnamon Leaf Essential Oil. However, oil distilled from cinnamon bark tends to be much more costly than that distilled from the leaves.

Botanical name: Cinnamomum verum

Plant family: Lauraceae

Plant part typically used: Leaves or Bark

Color: Golden Yellow/Brown

Consistency: Slightly oily feeling

Aromatic description: Cinnamon Bark Essential Oil smells peppery, earthy, spicy, bright yet slightly woody.

Health benefits

Cinnamon essential oil contains a number of compounds thought to influence health. These compounds include cinnamaldehyde, which has been found to reduce inflammation and act as an antimicrobial (a substance that destroys or suppresses the growth of microorganisms, including bacteria and fungi).



Fig 3: cinnamon

4. Jasmine

Jasmine Absolute has an exquisitely floral aroma that is uniquely its own. Jasmine blossoms cannot be effectively steam distilled, so they are extracted by solvent to create a highly concentrated absolute. A tiny bit goes a very long way.

Botanical name: *Jasminum grandiflorum*

Plant family: Oleaceae

Plant part typically used: Flowers

Color: Deep Brown with a Golden Tinge

Aromatic description: Jasmine Absolute smells deep, rich, floral and exotic. Jasmine Absolute Uses



Fig 4: Jasmine

5. Lavender

Lavender Oil has a beautiful, versatile aroma. It is anti-bacterial and is a must-have for your first-aid kit. Its calming and sedative properties make Lavender Essential Oil a wonderful oil to help relax, fight stress and to promote sleep. And when properly diluted, it's amongst the safest of essential oils. Lavender Essential Oil is well known for its sedative properties and for its ability to help calm stress and anxiety and to help promote sleep. If used in excess, however, Lavender Oil can actually act as a stimulant.

Botanical name: *Lavandula angustifolia/Lavandula officinalis*

Plant family: Lamiaceae

Common method of extraction: Steam Distilled Plant Part

Typically used: Leaves and Flowers/Buds **Color:** Clear with a Tinge of Yellow

Consistency: Thin

Aromatic description: Lavender Essential Oil smells floral, fresh, sweet, herbaceous and sometimes slightly fruity. It can be slightly camphorous.

Lavender essential oil uses: Allergies, Anxiety, Asthma, Athlete's, Foot Burns, Chicken Pox, Colic, Cuts, Cystitis, Depression, Headache, Hypertension, Insect Bites, Insect, Repellent, Itching, Labor Pains, Migraine, Oily Skin Stress, Stretch Marks



Fig 5: Lavender

6. Clove oil

Usually when an essential oil is simply referred to as Clove Essential Oil, the oil pertains to essential oil distilled from the buds. However, it's best to always doublecheck with a supplier to confirm if the oil is indeed distilled from the buds or possibly the stems or leaves. This profile pertains to Clove Bud Essential Oil, except where otherwise noted. Clove Bud Essential Oil is steam distilled from the flowering buds of the clove tree. Clove stem and clove leaf essential oils are also available, but essential oil distilled from the buds is generally favored due to its composition and aroma.

Clove Bud Essential Oil generally contains up to 85% Eugenol, a phenol that dramatically contributes to the oil's aroma, therapeutic properties, and safety precautions. Clove Bud Essential Oil is also comprised of a number of other constituents, particularly the sesquiterpene B-caryophyllene and the ester Eugenyl acetate.

Clove Essential Oil is very helpful for use in blends intended to help relieve pain. It is also a powerful anti-microbial essential oil. However, being referred to as an "anti-microbial" oil does not mean that it is capable of killing all forms of microbes, bacteria and viruses.

Botanical name: *Syzygium aromaticum / Eugenia caryophyllata*

Plant Family: Myrtaceae

Common method of extraction: Steam Distilled

Plant part typically used: Buds

Color: Pale Yellow

Aromatic description: Clove Bud Essential Oil smells spicy, warming yet slightly bitter. It is also slightly woody in character and is reminiscent in aroma to that of true clove buds but is of course much stronger in aroma.

Clove essential oil uses: Cognitive support and brain health. Pain Relief, Bacterial Infection, Fungal Infection, Viral Skin Infection, Toothache, Gum Disease Muscle Pain, Flu, Nausea, Infection, Ringworm.



Fig 6: Clove

Essential Oil Safety Issue

The essential oils are generally safe with minimum adverse effects. Several of these have been approved as food additives and fall in the category of generally recognized as safe by the U.S. Food and Drug Administration. The most common adverse events are eye, mucous membrane and skin irritation and sensitization particularly to oils containing aldehydes and phenols. Photo toxicity of essential oil that contains furocoumarins, for example Citrus bergamia, is also reported. Contact sensitization is more likely to occur due to oxidation of monoterpenes, often due to inappropriate storage conditions. Cross-sensitization to other essential oils and foods is also possible. Allergy from inhaled essential oils can occur; however, data about exposure levels are limited and many of the reports concern perfumes rather than aromatherapy essential oils. An exceptional case of airborne contact dermatitis was reported only once in context to aromatherapy without massage. The aromatherapy utilizes non defined mixtures of these essential oils without disclosing their plant sources. Allergic reactions have been reported in few instances, especially with topical administration. These oils are not free from oxidization reaction with age and are reported for the change in their chemical composition on storage for long time. Reversible prepubertal gynecomastia was reported in one study on repeated exposure to lavender and tea tree oils by topical administration. There is always a big controversy which arises when the safety of these essential is discussed. No well-defined studies have proved that these essential oils are harmful. In case of some isolated studies, we have observed that these are not safe, but the majority of studies have not proved these oils if used in aromatherapy are harmful.

Conclusion

From above reports and study, we can conclude that aromatherapy is natural and noninvasive gift of nature for humans. It's not only the disease symptoms which are eradicated but the whole body is rejuvenated by the use of aroma. Aromatherapy regulates the physiological, and psychological upliftment for the new phase of life. This therapy is not only preventive but also can be used in the acute and chronic stages of disease. Pharmaceutical industries are trying for environmentally friendly, alternative and natural medicine for disease associated with pathogens and

metabolism. There may be a possibility of enhancing the rate of reaction and bioavailability of drugs from the use of these essential oils. If properly studied, these volatile oils may have the synergistic effect with the drugs used in the treatment of central nervous system disorder. Moreover, the time at which the plant contains the maximum amount of volatile oil with various chemical constituents also is a matter of discussion. Essential oils can be a useful non medicinal care.

References

1. Kalembe D, Kunicka A. Antibacterial and antifungal properties of essential oils. *Curr Med Chem.* [PubMed] [Google Scholar],2003;10:813-29
2. Thosar N, Basak S, Bahadure RN, Rajurkar M. Antimicrobial efficacy of five essential oils against oral pathogens: An *in vitro* study. *Eur J Dent.* [PMC free article] [PubMed] [Google Scholar],2013;7(1):S71-7
3. Végh A, Bencsik T, Molnár P, Böszörményi A, Lemberkovics E, Kovács K *et al.* Composition and antipseudomonal effect of essential oils isolated from different lavender species. *Nat Prod Commun.* [PubMed] [Google Scholar],2012;7:1393-6
4. Shaheen E, Lakhan, Heather Sheaffer, Deborah Tepper. "The Effectiveness of Aromatherapy in Reducing Pain: A Systematic Review and Meta-Analysis", *Pain Research and Treatment*, Article ID 8158693, 2016, 2016(13).
5. Andreu V12*, Amiot A2, Safont M1, Levert A2, Bertrand Andreu *et al.* First Phytochemical Characterization and Essential Oil Analysis of the Traditional Catalan Wild Salad: "Coscoll" (*Molopospermum peloponnesiacum* (L.) Koch) *Med Aromat Plants*,2015;4:4
6. Candace B Jaruzel, Mathew Gregoski *et al.* Aromatherapy for Preoperative Anxiety: A Pilot Study *Journal of Peri Anesthesia Nursing*,2019;34(2):259-264
7. Babar Ali, Naser Wabel *et al.* Essential oils used in aromatherapy, A systemic review *Asian Pacific Journal of Tropical Biomedicine*,2015;5(8):589-598
8. Azar Jafari-Koulaee, Forouzan Elyasi, Zohreh Taraghi. A Systematic Review of the Effects of Aromatherapy with Lavender Essential Oil on Depression, 2020, 9(1)
9. Mohaddese Mahboubi Ghasem Haghi Antimicrobial activity and chemical composition of *Mentha pulegium* L. essential oil *Journal of Ethnopharmacology*,2008;119(2):325-32
10. Ferda Candan, Mehmet Unlu, Bektaş Tepe *et al.* Antioxidant and antimicrobial activity of the essential oil and methanol extracts of *Achillea millefolium* subsp. *millefolium* Afan. (Asteraceae) *Journal of Ethnopharmacology*,2003; 87(2-3):215-220
11. Esfahani Arezoo, Ehsani Mohammadreza, Mizani Maryam. The synergistic effects of *cinnamon* essential oil and nano TiO₂ on antimicrobial and functional properties of sago starch films *International Journal of Biological Macromolecules*,2020;157:743-75
12. Cooke B, Ernst E. Aromatherapy: a systematic review. *British Journal of General Practice*,2000;50(455):493-496.
13. Buckle J. Use of aromatherapy as a complementary

- treatment for chronic pain. *Alt Ther*,1999;5:42-51.
14. Papadopoulos A, Wright S, Ensor J. Evaluation and attributional analysis of an aromatherapy service for older adults with physical health problems and carers using the service. *Compl Ther Med*,1999;7:239-244
 15. Romine IJ, Bush AM, Geist CR. Lavender aromatherapy in recovery from exercise. *Percept Mot Skills*,1999;88:756-758.
 16. Sugawara Y, Hino Y, Kawasaki M *et al*. Alteration of perceived fragrance of essential oils in relation to type of work: a simple screening test for efficacy of aroma. *Chem Senses*,1999;24:415-421.
 17. Nan LV, Xiao Jun Liu, Zhu *et al*. Aromatherapy and the Central Nerve System (CNS): Therapeutic Mechanism and its Associated Gene Current Drug Targets Bentham Science Publishers,2013;14(8):872-879
 18. Shaheen E, Lakhan 1,2, Heather Sheaffer1, Deborah Tepper3. The Effectiveness of Aromatherapy in Reducing Pain: A Systematic Review and Meta-Analysis Hindawi Publishing Corporation Pain Research and Treatment, Article ID 8158693, 2016, 13