

## **AROMATHERAPY AND ESSENTIAL OILS: A HOLISTIC APPROACH TO HEALTH, WELLNESS, AND COMPLEMENTARY MEDICINE**

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### **ABSTRACT**

Aromatherapy is an ancient healing practice and it mainly derived from the plant source which gained significant attention in modern complementary medicine. Essential oils are commonly extracted from steam distillation, cold pressing, are used in various applications, like inhalation, topical massage, and diffusion, to exert physiological and psychological effects. Therefore, many studies have proved that essential oils are used for anxiety relief, pain management, stress reduction, and improve our sleep. The main mechanism of action of aromatherapy involves olfactory stimulation, where volatile compounds interact with the limbic system of the brain, influencing our mood, memory and hormone balance. Moreover, its growing popularity, aromatherapy is not without limitations. The efficacy of essential oils varies based on purity, concentration, and method of administration. Inconsistent standardization and potential adverse effects like skin irritation and allergic reactions, necessitate proper usage guidelines. Although there are many studies which support the therapeutic

usage of aromatherapy, but clinical studies are required for dosage recommendation. It's more important that aromatic oils are diluted with carrier oils, patch testing and consultation with

healthcare professionals, are essential for ensuring effective and risk-free usage. Essential oils like lavender oil (*Lavandula officinalis* Chaix), peppermint oil (*Mentha piperita* Linn) have anti-inflammatory, analgesic, and sedative properties. As a demand for natural and holistic therapies continues to rise, aromatherapy remains a promising complementary approach to health and wellness. Future research should focus on standardization, evidence-based application, and potential drug interactions to optimize the safe and effective use of aromatherapy.

**KEYWORDS:** Aromatherapy, essential oil, olfactory receptors, limbic system, carrier oil.

## 1. INTRODUCTION

Aromatherapy has been used for thousands of years for a variety of purposes, including medicine, cosmetics, and rituals. The term “Aromatherapy” was coined by French chemist Rene-Maurice Gattefosse in 1935.<sup>[1]</sup> Essential oils and other fragrant compounds are used in aromatherapy, a holistic therapeutic technique, to enhance both mental and physical health. There is proof that this procedure has been in use for ages, going all the way back to ancient civilizations.<sup>[2]</sup> These days, aromatherapy is a well-liked supplemental therapy that is utilized in homes, hospitals, and spas. Aromatherapy has roots in ancient Egyptian, Chinese, and Indian cultures that date back more than 3,500 years.<sup>[3]</sup> Over time, the tradition of using aromatic herbs and oils for spiritual and therapeutic purposes spread throughout the world.<sup>[4]</sup> In recent years, studies have shown that aromatherapy has been effective in improving anxiety and sleep quality among various groups of patients. Several *meta*-analyses concluded a significant reduction in anxiety.<sup>[5]</sup> and significant improvement in sleep quality among various groups of patients after administering aromatherapy.

### 1.1. Mechanism of action of aromatherapy

Aromatherapy works by stimulating the sense of smell and absorbing it through the skin. When essential oils are inhaled, they activate olfactory receptors and send messages to the limbic system, which regulates emotion and memory.<sup>[6]</sup> As a result, it relieves tension, improves mood, and promotes relaxation. When essential oils are administered topically, they reach the bloodstream. It has antibacterial, anti-inflammatory and analgesic properties.<sup>[7]</sup> It also affects neurotransmitters like serotonin, which improves mood and cortisol, which reduces stress. Breathed oils like eucalyptus are also beneficial to our respiratory system. Through scent and transdermal absorption, aromatherapy enhances well-being and typically has a favourable impact on hormones, the brain and the nervous system.<sup>[8]</sup>

Aromatherapy is a holistic treatment approach that uses natural plant extracts called essential oils to promote mental, emotional, and physical health wellness. Smell is the most important sense through which it profoundly affects the body. Techniques like distillation or cold pressing, these essential oils are extracted from a variety of plant parts, such as flowers, leaves, stems, bark, and root.<sup>[9]</sup> The other name of aromatherapy is essential oil therapy.<sup>[10]</sup>

### 1.2. The essence of Essential oils and aromatherapy

The essential oils have gained their importance in therapeutic, cosmetic, aromatic, fragrant and spiritual uses.<sup>[11]</sup> Aromatherapy uses essential oils, as the main therapeutic agents, which are said to be highly concentrated substances extracted from flowers, leaves, stalks, fruits and roots, and also distilled from resins.<sup>[12]</sup> Essential oils are a mixture of saturated and unsaturated hydrocarbons, alcohol, aldehydes, esters, ethers, ketones, oxides phenols and terpenes, which may produce characteristic odors.<sup>[13]</sup> They are colorless pleasant smelling liquids with high refractive index. These oils are so potent and concentrated that they work on pressure points and rejuvenate. The essential oils in plants are present in different areas like, pockets and reservoirs, glandular hairs, specialized cells, or even in the intercellular spaces.



**Figure 1: Essential oils.**

The essential oils are extracted mainly from plant source through various methods like steam distillation and cold pressing methods by which they capture the plant's aroma and therapeutic properties.<sup>[14]</sup> There is numerous health benefits to the natural compounds found in these concentrated volatile oils. The use of aromatherapy in ancient traditions for physical

and mental health benefits has been rooted in modern holistic health.<sup>[15]</sup> Some of the essential oils namely tea tree oil, lavender oil, eucalyptus oil, have unique properties that can able to calm our mind, support the body's natural healing processes and alleviate stress.<sup>[16]</sup> These oils are also used for many purposes like massage therapies, inhalation, and diffusion, to overcome the problems like anxiety, insomnia, and respiratory discomfort.<sup>[17]</sup>

Today, aromatherapy is popular in United States and around the world. Although many claims have been made relating to the benefits of aromatherapy, most research has focused on its use to manage depression, anxiety, muscle tension, sleep disturbance, nausea, and pain.<sup>[18]</sup> Some studies suggest that olfactory stimulation related to aromatherapy can result the immediate reduction in pain, as well as changing physiological parameters such as pulse, blood pressure, skin temperature, and brain activity.<sup>[19]</sup>

## **2. Classification of aromatherapy**

### **2.1. 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.<sup>[20]</sup>

### **2.2. 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.<sup>[21]</sup>

### **2.3. Medical aromatherapy**

The founder of modern aromatherapy Rene-Maurice Gattefosse 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.<sup>[22]</sup>

### **2.4. 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 odour

memories. Essential oils are complemented to medical treatment and can never be taken as a replacement for it.<sup>[23,25]</sup> the olfactory pathway through which essential oils are inhaled connects to the brain's limbic system, responsible for emotional and behavioural processes.

## 2.5. 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 aromacology, 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.<sup>[26]</sup>

## 3. Some plants used in aromatherapy

Many plants have been reported to use in the aromatherapy due to presence of essential or volatile oils in different plants. Plants producing essential oils<sup>[27]</sup> materials like flowers, barks, stem, leaves, roots, fruits etc.

### 3.1. Lavender

Lavender (*Lavandula officinalis* Chaix.) belongs to the Lamiaceae family and is a beautiful garden herb. It contains camphor, terpinen-4-ol, linalool, linalyl acetate, beta-ocimene, and 1,8-cineole. Its constituents vary.<sup>[28]</sup> Concentration and therapeutic benefits with various species. Linalool and linalyl acetate effectively absorb from the skin during massage, leading to a reduction in the central nervous system 1 activity. Linalool has calming effects, while linalyl acetate is a strong narcotic.<sup>[29]</sup> The usage of lavender pillows in anxiety patients may be due to its ability to improve sleep quality, boost mental alertness and reduce hostility and anxiety.<sup>[30]</sup> Lavender oil has antibacterial and antifungal activities against a variety of germs, particularly when drugs are ineffective. However, the specific processes remain unknown. Aromatherapy has been shown to effectively treat abrasions, burns, tension, headaches, promote new cell formation, skin problems, aching muscles and enhance the immune system. This oil is used to treat primary dysmenorrhea and has showed good outcomes in randomized, double-blind trials.<sup>[31]</sup>





**Figure 2: *Lavandula officinalis* Chaix. (Lavender).**

### 3.2. Lemon

Lemon [*Citrus limon* Linn. (*C. limon*)] belongs to the family of Rutaceae. *C. limon* long trees grow up to the 15 feet height and bear rich scented lemon fruits all year round. Its oil constituents are abundant in the terpenes, D-limonene and Limonene, together forming about 90 percent of the bulk of the oil. Traces of phellandrene, pinene and sesquiterpene are also present.<sup>[25]</sup> The valuable portion of the oil is the remaining 10 percent which consists of oxygenated bodies, chiefly the aldehyde citral, to which the odour of the oil is largely due and of which there is 3.5%–5% odour present in the oil. When compared to other essential oils, its constituents have antiseptic, astringent and detoxifying properties, for blemishes associated with oily skin.<sup>[32]</sup> Its oil brightens and rejuvenates dull skin. Lemon essential oil is mainly used to boost the immune system and to accelerate the white corpuscles production along with counteracting acidity and ulcers through citric acid, which helps digestion, by forming carbonates and bicarbonates of potassium and calcium.<sup>[33]</sup> A recently conducted double-blinded, randomized, controlled clinical trial study on aromatherapy has suggested that citrus oil is good in relieving the first stage labor pain. It is effective in controlling the nausea and vomiting along with its mood elevating properties.<sup>[34-35]</sup>



**Figure 3: *C. limon* Linn. (Lemon).**

### 3.3. Peppermint

Peppermint (*Mentha piperita* Linn.) is part of the Lamiaceae family. Currently, all 600 mint varieties are derived from 25 distinct species. The most significant are peppermint (*M. piperita*) and spearmint (*Mentha spicata*).<sup>[36]</sup> Spearmint has a rich sweet scent with a harsh menthol undertone. The oil contains carvacrol, menthol, carvone, methyl acetate, limonene, and menthone.<sup>[37]</sup> The pharmacological activity is attributed to menthol, a key component of peppermint oil. Peppermint oil contains at least 44% of free menthol. Climate, latitude, and plant maturity all have an impact on component performance.<sup>[38]</sup>



**Figure 4: Piperita Linn. (Peppermint).**

Menthol can induce skin reactions when inhaled or applied topically. It is commonly used in liniments to treat pain, spasms, and arthritis.<sup>[57]</sup> Peppermint oil has been researched for its anti-inflammatory, analgesic, anti-infectious, antimicrobial, antiseptic, antispasmodic, astringent, digestive, carminative, fungicidal effects, nervine stimulant, vasoconstrictor, decongestant, and stomachic characteristics.<sup>[39]</sup> Oil's antispasmodic effects make it ideal for relieving menstruation pain and treating irritable bowel syndrome. Applying it to the head and temples effectively relieves headaches. Itching caused by herpes, ringworm, scabies, poison oak, and ivy can be cured. It can effectively treat bacterial, fungal, and viral infections when inhaled or administered as a vapor balm.<sup>[40]</sup> This oil is recognized to relieve sinus and lung congestion. Researchers have explored the different benefits of Mentha oil, but its usage in aromatherapy requires further investigation.<sup>[41]</sup>

### 3.4. Roman chamomile

Roman chamomile (*Anthemis nobilis* Linn.) belongs to the family of Asteraceae. A prized plant for centuries with a potential to calm, moderate and strong emotions bear a daisy like

flowers. Major constituents of Roman chamomile oil are esters of angelic acid, tiglic acid and 2-methylbutanoic acid. The freshly distilled oil has a bluish tint due to the sesquiterpenoid chamazulene. It is rich in pinocarvone, farnesol, pinene, bisabolol, cineole, pinocarveol, beta-caryophyllene, azulene, camphene and myrcene. Chamomile preparations have made inroads in the treatment of human ailments such as hay fever, inflammation, muscle spasms, menstrual disorders, insomnia, ulcers, wounds, gastrointestinal disorders, rheumatic pain, and hemorrhoids. In cosmetics and aromatherapy, it is employed for its anxiolytic properties.<sup>[42,43]</sup> Its antianxiety, stress relieving properties ease out depression, worry, and overactive mind. Its use before sleep for bath can relax both mind and body and brings on sleep, with a peaceful and spiritual awareness. Headache, insomnia and menstrual disorders are known to be treated with this oil. In aromatherapy, it is extensively used to relieve the pain from physical conditions, menstrual cramps and tension with its application on lower abdomen. Psoriasis, eczema, boils, sunburn and cold sores have been treated with it along with its role in decreasing the pain associated with joints, arthritis, sprains and stings.<sup>[33]</sup>



**Figure 5: Anthemis nobilis Linn. (ROMAN CHAMOMILE).**

### 3.5. Rosemary

Rosemary (*Rosmarinus officinalis* Linn.) is a member of the Lamiaceae family with small pale blue blooms that bloom in late spring/early summer. It can reach a height of 90 cm. There are three varieties: silver, gold, and green stripe.<sup>[44]</sup> The green variety is utilized for medical purposes. The plant contains bitter principle, resin, tannic acid, and volatile oil. The active ingredients include bornyl acetate, borneol, esters, and a camphor comparable to that found in myrtle, including cineol, pinene, and camphene.<sup>[45]</sup> The oil effectively treats digestive issues such as indigestion, constipation, and colitis. It works as a liver and



gallbladder tonic. The oil also has some beneficial effects on the cardiovascular system.<sup>[46]</sup> It regulates blood pressure and slows the hardening of vessels. It was taken in the winter to treat rheumatic pain exacerbated by the cold. Its stimulating actions on the neurological system have been shown to help with hysteria and paralysis.<sup>[47]</sup> Aromatherapy has been shown in human trials to be an effective non-pharmacological treatment for dementia and may improve cognitive performance, particularly in Alzheimer's patients, due to its free radical scavenging properties.<sup>[48]</sup> Rosemary can stimulate the scalp, promote hair development, and treat dandruff and oily hair.<sup>[49]</sup>



**Figure 6: *Rosmarinus officinalis* Linn. (Rosemary).**

### 3.6. Ylang Ylang

Ylang-ylang (*Cananga odorata* Hook. F. & Thoms) is a tiny tree found in Madagascar, Indonesia, and the Philippines. It belongs to the Annonaceae family. The chemical constituents include geranyl acetate, linalol, geraniol farnesol, benzyl acetate, geranial, methyl chavicol, beta-caryophyllene, eugenol, pinene, and farnesene. This tree's main benefit is its ability to slow heart rate and breathing, making it ideal for use in shock or trauma circumstances. Its anti-depressive and euphoric qualities promote a sense of wellbeing.<sup>[50]</sup> Women with low self-esteem and post-menopausal syndrome get better outcomes. In Portugal, pilot research of 34 nursing professionals found that using ylang ylang essential oil reduced anxiety and increased self-esteem, while also affecting blood pressure and temperature. The study found that using this plant significantly improved self-esteem. The exotic aroma of this product is beneficial for both dry and oily skin, making it erotic in nature. It is also used to treat depression, anxiety, hypertension, frigidity, stress, and palpitations.<sup>[51]</sup>



**Figure 7: *Cananga odorata* Hook. F. & Thoms. (Ylang Ylang).**

### 3.7. Jojoba oil

Jojoba oil (*Simmondsia chinensis*) is a light, non-comedogenic carrier oil that closely resembles the skin's own sebum. It profoundly hydrates, controls oil production, and soothes sensitive or acne-prone skin.<sup>[17]</sup> Its anti-inflammatory qualities aid to relieve eczema, psoriasis, and sunburn. Jojoba oil is also beneficial to scalp health, decreasing dandruff and increasing hair growth. It absorbs fast without leaving a greasy behind, making it an excellent choice for face serums and massage oils. Jojoba oil is a common ingredient in natural skincare, aromatherapy, and cosmetic formulations due to its high stability and long shelf life.<sup>[52]</sup>



**Figure 8. JOJOBA OIL**

**Table 1: Extraction Methods and Uses of Plant Oils.**

Plant	Extraction Method	Why This Method	Notes
Lavender	Steam Distillation	Preserves volatile aromatic compounds. Common for most herbs.	Yields high-quality essential oil and hydrosol. <sup>[53]</sup>
Lemon	Cold Pressing (Expression)	Ideal for citrus peels; preserves fresh, zesty aroma.	Performed on lemon rind (not pulp or juice). <sup>[54]</sup>
Peppermint	Steam Distillation	Efficient for extracting menthol and other volatile oils from leaves.	Best done with dried or partially dried leaves. <sup>[55]</sup>
Roman Chamomile	Steam Distillation	Gentle enough to preserve delicate floral components.	Low yield; flowers are sensitive. <sup>[56]</sup>
Rosemary	Steam Distillation	Effective for extracting camphor, cineole, and other aromatic compounds.	Leaves and flowering tops are used. <sup>[57]</sup>
Ylang Ylang	Steam Distillation (Fractional)	Fractional distillation captures different aromatic profiles (extra, I, II, III grades).	Flowers are distilled in stages; "extra" is most valued in perfumery. <sup>[58]</sup>
Joboba Oil	Cold Pressing (Mechanical)	Preserves long-chain wax esters and nutrients without heat degradation.	Technically a liquid wax; used as a carrier oil, not an essential oil. <sup>[59]</sup>

#### 4. Regulation guidelines of essential oils

Essential oils, highly concentrated after distillation, are regulated as cosmetics by the FDA without pharmaceutical-level testing. Though natural, they can cause allergic reactions, phototoxicity, skin irritation, and respiratory distress. Undiluted use or ingestion without guidance poses serious health risks, especially with citrus oils exposed to sunlight. Caution is essential.<sup>[32]</sup>

#### 5. Anxiety and Stress relief

Essential oils have shown promising therapeutic potential in aromatherapy for anxiety and stress relief. Multiple studies have demonstrated the anxiolytic effects of various essential oils in both preclinical and clinical trials.<sup>[60]</sup> Commonly used anxiolytic oils include lavender, rose, orange, bergamot, lemon, sandalwood, clary sage, Roman chamomile, and rose-scented geranium. Interestingly, while some studies report short-term improvements in anxiety, depression, and overall wellbeing for up to 8 weeks after treatment, there is no evidence of long-lasting effects from aromatherapy massage.<sup>[61]</sup> The mechanisms of action are thought to involve monoamine neurotransmitters, amino acid neurotransmitters, and the hypothalamic-pituitary adrenal axis. Inhalation of essential oils can stimulate the olfactory system and trigger the release of neurotransmitters like serotonin and dopamine, which help regulate

mood. In conclusion, aromatherapy using essential oils appears to be a promising complementary approach for managing anxiety and stress, with fewer side effects compared to traditional drugs.<sup>[62]</sup>

## 6. Safety and Toxicity

Essential oils used in aromatherapy have demonstrated therapeutic potential, but safety considerations are paramount for their responsible use. While generally considered safe, essential oils can pose risks if not used properly.<sup>[63]</sup> Several studies have reported minimal adverse effects from essential oils, but potential risks include skin irritation with prolonged contact, allergic reactions, and phototoxicity when exposed to sunlight. Ingesting large amounts can be dangerous, and some oils like lavender and tea tree have been associated with reversible prepubertal gynecomastia when applied topically repeatedly.<sup>[62]</sup> Additionally, although essential oils are often perceived as natural alternatives with fewer side effects compared to traditional drugs, allergic reactions and toxicity can occur, especially after oral ingestion.

## 7. CONCLUSION

A natural and comprehensive method for improving mental, emotional, and physical health is aromatherapy. Essential oils including lavender, peppermint have been shown to have therapeutic effects, and research supports their advantages in pain management, stress alleviation, and sleep enhancement. But issues like purity, standardization, and possible adverse effects draw attention to the necessity of using it carefully. Aromatherapy should not be used in place of medical care, even while it supports traditional therapies. To confirm its effectiveness, safe use and additional study are necessary. Aromatherapy can remain an effective supplemental treatment for general health and wellness with appropriate use and scientific research.

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