

REVIEW

**AROMA THERAPY: AN ART OF HEALING****D. Halder, B. B. Barik, R.K. Dasgupta, S. Deb Roy**

Deptt. Of Pharmacognosy, Bharat Technology, Banitabla, Uluberia, Howrah, West Bengal.

Submitted on: 15.07.18;**Revised on: 08.08.18;****Accepted on: 19.08.18**

ABSTRACT: Aroma therapy is one of the most ancient healing arts & traces its origin to 4500BC, when Egyptians used aromatic substances in medicines. The term Aromatherapy was coined by Prof. Gatte'Fosse, a French cosmetic chemist. Aromatherapy is a holistic healing treatment that uses natural plant extracts from flowers, bark, stems, leaves, roots or other parts of plants to enhance psychological and physical well-being. The inhaled aroma from "essential" oils is widely believed to stimulate brain function. Essential oils can also be absorbed through the skin, where they travel through bloodstream and can promote whole-body healing. Aromatherapy activates areas in nose called olfactory receptors, which send messages through nervous system to brain. The oils may activate certain areas of brain, like limbic system, which plays a role in controlling emotions. They could also have an impact on your hypothalamus, which may respond to the oil by creating a good feeling in brain. Its use ranges from pain relief, mood enhancement and increased cognitive function to treat asthma, insomnia, fatigue, depression, inflammation, alopecia, cancer, arthritis, erectile dysfunction, menstrual disorders, menopausal syndromes, etc. According to the National Association for Holistic Aromatherapy, the most popular essential oils include fennel, geranium, lavender, lemongrass etc.

KEY WORDS: Aromatherapy, Volatile oil, Holistic treatment.

Corresponding Author: Debojyoti Halder
E-Mail: debojyotihalder955@gmail.com
Phone: +91-7980474618

Indian Research Journal of Pharmacy and Science; 17(2018)1540-1558;
Journal Home Page: <https://www.irjps.in>
DOI: 10.21276/irjps.2018.5.3.2

INTRODUCTION:

Now-a-days, traditional & alternative systems of medicine has gained importance they deserve, for their medicinal as well as therapeutic values. Various therapies as well as physiological & psychological treatments used for healing has gained some momentum. "Aromatherapy" is a type of alternative medicine practice utilizing fragrance or aromatic essential oils derived from a wide variety of plants.

Aromatherapy has established itself for the treatment of various complications as well as diseases. The essential or volatile oils are the principle active ingredients from various sources which acts as medicaments for treating various ailments. These essential oils are extracted from flowers, barks, stem, leaves, roots, fruits, and other parts of the plant by various methods of extraction. Aromatherapy is a holistic therapy and an art of using essential oils from plants in the pursuit of well-being, whether mental, emotional, physical or aesthetic. The word "aroma" means fragrance or sweet smell & "therapy" means a treatment designed to cure. The fragrance in a plant is stored in its essential oils. Hence, in using essential oils, aromatherapy recreates the environment of mesmerizing essence & fragrance.¹

Origin of Aromatherapy:

Aromatherapy is one of the most ancient "Art of

Healing" which originated even before 5000BC, when Egyptians used aromatic substances in medicines. In Greek system of medicine as well as in Ayurveda, plant essences & fragrances are used for aromatic baths & scented massage. The term "Aromatherapie" initially used by French cosmetic chemist G. Fosse in a book first published in 1936. A laboratory accident caused third degree thermal burns on Dr. Maurice G. Fosse's hand and forearm. He plunged his arm into a vessel of lavender oil, mistakenly assuming it was water. To his surprise, the pain ceased within moments; and with regular application of lavender oil, the wound healed without a scar. When he analysed the lavender oil, he discovered many chemical constituents or components, which he concluded had tremendous healing properties. He then began researching the healing properties of other essential oils, taking into consideration their chemical properties as well as their smells. Marguerite Maury, another French chemist became interested in Aromatherapy in the World War II period, where she used aromatherapy in combination with other natural health remedies & beauty products. She developed a separate strand of aromatherapy in France, which employed the oils externally, rather than internally, & combined them with massage. Jean Valnet, a French physician added to Gattefosse's research while working as a surgeon in World War II.²



Figure 1: Essential oils in marketed forms & Stimulation of Olfactory receptors by aromatic fragrance.

Essential oils:

Aromatherapy utilizes various essential oils that can be issued through topical application, massage, inhalation or water immersion to stimulate a desired therapeutic response. Essential oils possess therapeutic activity. They are colourless pleasant smelling liquids with high refractive index. They possess healing powers of plants. Essential oils are a mixture of saturated and unsaturated hydrocarbons, alcohol, aldehydes, esters, ethers, ketones, oxides phenols and terpenes, which may produce characteristic odours. Essential oils are volatile liquid substances extracted from aromatic plant material by steam distillation or mechanical expression (oils produced with the aid of chemical solvents are not considered true essential oils). They are made up of oxygen, amino acids and minerals whose function is to carry nutrients directly into the nucleus of cell. Essential oils are neither acidic nor alkaline. They have the ability to go into the body tissues and literally become free radical scavengers. These oils are so potent and concentrated that they work on pressure points and rejuvenates the body. The essential oils in plants are present in different areas like, pockets and reservoirs, glandular hairs, specialized cells, or even in the intercellular spaces.^{3,4}

Essential oils have the highest level of oxygen molecules of any substance known to man and we know disease cannot exist or grow in an oxygen rich environment. Essential oils containing sesquiterpenes have the ability to cross the blood-brain barrier, thus carrying oxygen directly into the brain. A brain deprived of oxygen for as little as 5 minutes, will have irreversible brain damage.⁴

Many essential oils act as antibacterial, anti-fungal, anti-infectious, antimicrobial, anti-parasitic, anti-viral, anti-septic, antitumor, and immune

stimulating agents. Viruses cannot mutate or replicate in the presence of essential oils because of their complex chemical structures. Essential oils also detoxify the cells and blood in the body.^{1,4}

Essential oils are aromatic volatile liquids distilled from shrubs, flowers, trees, bushes, and seeds. They contain highly oxygenating molecules. Essential oils are called "essential" because the plant would die without them. They are made up of oxygen, amino acids and minerals whose function is to carry nutrients directly into the cell nucleus. Essential oils are neither acidic nor alkaline. Destruction of tissues is caused by acid, whether it is due to disease or inflammation. Essential oils have the ability to go into the body tissues and literally become "free radical scavengers." They are acid binding and promote excretion of acid that causes cell irregularities. Essential oils are 50 to 70 times more therapeutically potent than the herbs or plants from which they are derived. When the plant is cut and dehydrated, 98% of the life substance that is responsible for the healing power of that plant is evaporated. This is why essential oils are so much more powerful in healing than herbs.⁵

Common constituents found in essential oils are esters, aldehydes, ketones, sesquiterpenes, oxides, monoterpenes, alcohols, and phenols. These molecules each have characteristics that are unique and that give the essential oil its specific therapeutic quality.⁵

Therapeutic-grade oils can be checked to see if they meet the agreed upon standards set by AFNOR (Association French Normalization Organization Regulation) that determines if an oil is therapeutic grade. The ISO (International Standards Organization) has also set standards for the therapeutic-grade essential oils adapted from AFNOR. The AFNOR standard was written by a

team of government certified botanical chemists which determine and set a range that the constituents of a specified oil must be within in order to be of therapeutic quality. If two or more constituents are too high or too low, that oil cannot be certified as therapeutic grade, even though it may be of high quality.⁵

How Essential Oils Work?

The therapeutic activity of essential oils, like other plant-derived remedies, has yet to be fully realized. In addition, only a small proportion of the world flora (plant) has been examined for pharmacologically active compounds, but with the ever-increasing danger of plants- which are becoming extinct, there is a real risk that many important plant sources may be lost. Modern research has largely confirmed the traditionally held beliefs regarding the therapeutic uses of particular plants has changed with time. A herb such as basil, at one time described as a 'protection against evil', or 'good for the heart' whose scent 'taketh away sorrowfulness', may in modern usage be described as an excellent prophylactic, nerve tonic and antidepressant. Like herbal remedies, an essential oil can cover a wide field of activities; indeed the same herb or oil (such as lemon balm) can stimulate certain systems of the body while sedating or relaxing others. In order to gain a clearer understanding of the way essential oils work, and some of their particular areas of activity, it may be helpful to take an overall view of the systems of the human body.^{1, 3, and 4}

Chemistry of essential oils:

In course of time, secondary metabolites of plants greatly contributed to the human civilization. Secondary metabolites directly involved in the ecological process as well. Pigments and aromatic

compounds confer colour and scent to reproductive organs and fruits, thus attracting pollinators and favouring seed dispersal by animals. However, volatile compounds can also repel phytophagous organisms, including virus and phytoplasma vectors, whereas phytoalexins are broad-spectrum antimicrobial metabolites.⁵

In this complex scenario, humans have greatly benefited from plants and their secondary metabolites. During the plant-human coevolution, plants represented (and represent) a nearly unlimited source of food, feed for domesticated animals, fibres for clothes and, not the least, medicaments. Among the vastness of plant products, essential oils deserve particular attention.^{4, 5}

These are complex mixtures of hydrocarbons and oxygenated hydrocarbons arising from the isoprenoid pathways, mainly consisting in monoterpenes and sesquiterpenes. Essential oils are produced and secreted by glandular trichomes, specialized secretory tissues diffused onto the surface of plant organs, particularly flowers and leaves.⁵

Biosynthesis of Plant Volatiles in Glandular Trichomes

There are two main pathways for terpene biosynthesis, and most researchers hold that all steps of this route take place in the secretory cells themselves (Figure 2):

Molecules of Glandular trichomes (GTs) are modified epidermal hairs containing cells specialized for PVs synthesis and secretion. Noteworthy, other internal secretory structures can also synthesize and secrete PVs. GTs are found on leaves, stems, more rarely on petals, sepals, and petioles in roughly 30% of all.⁵

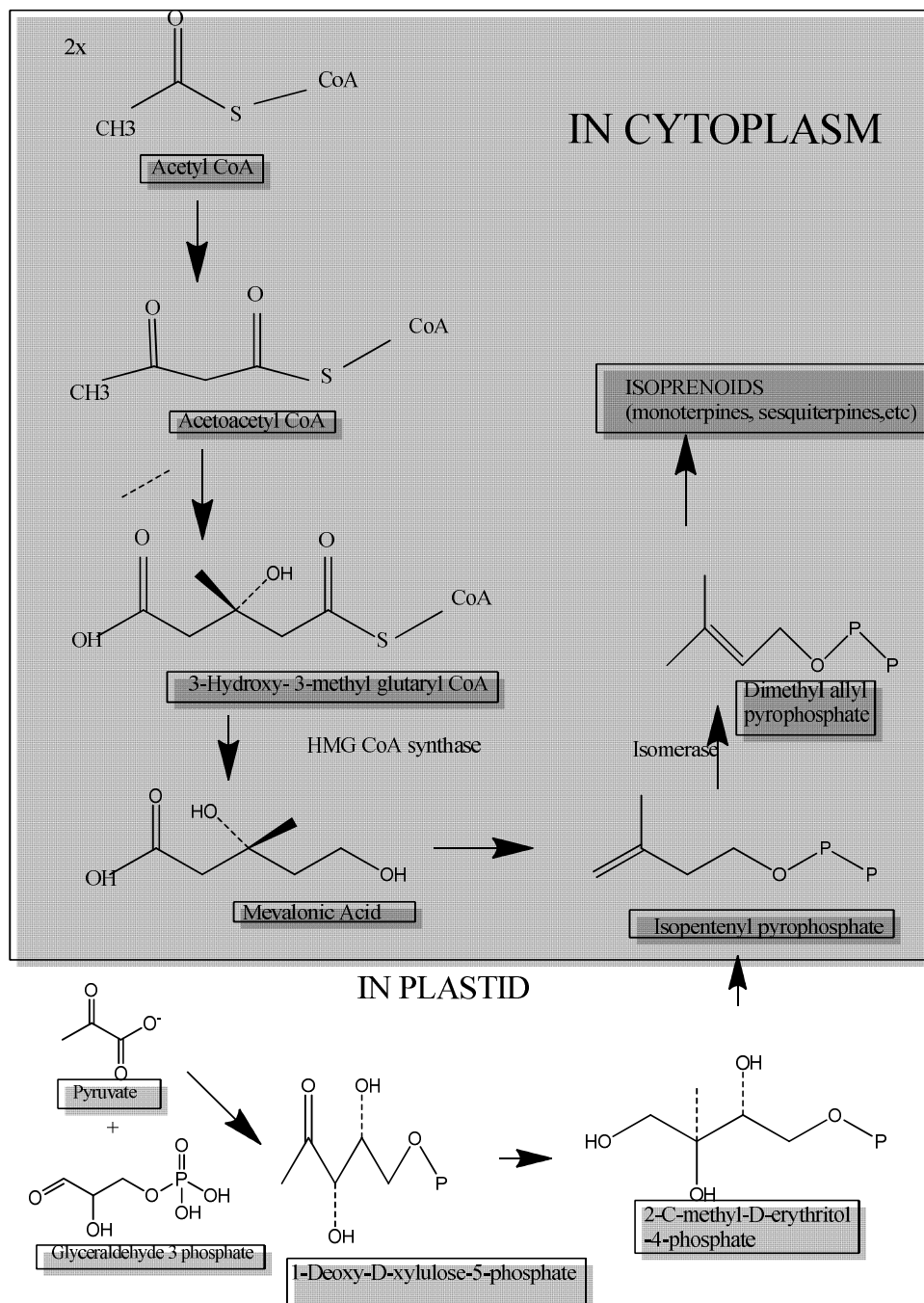
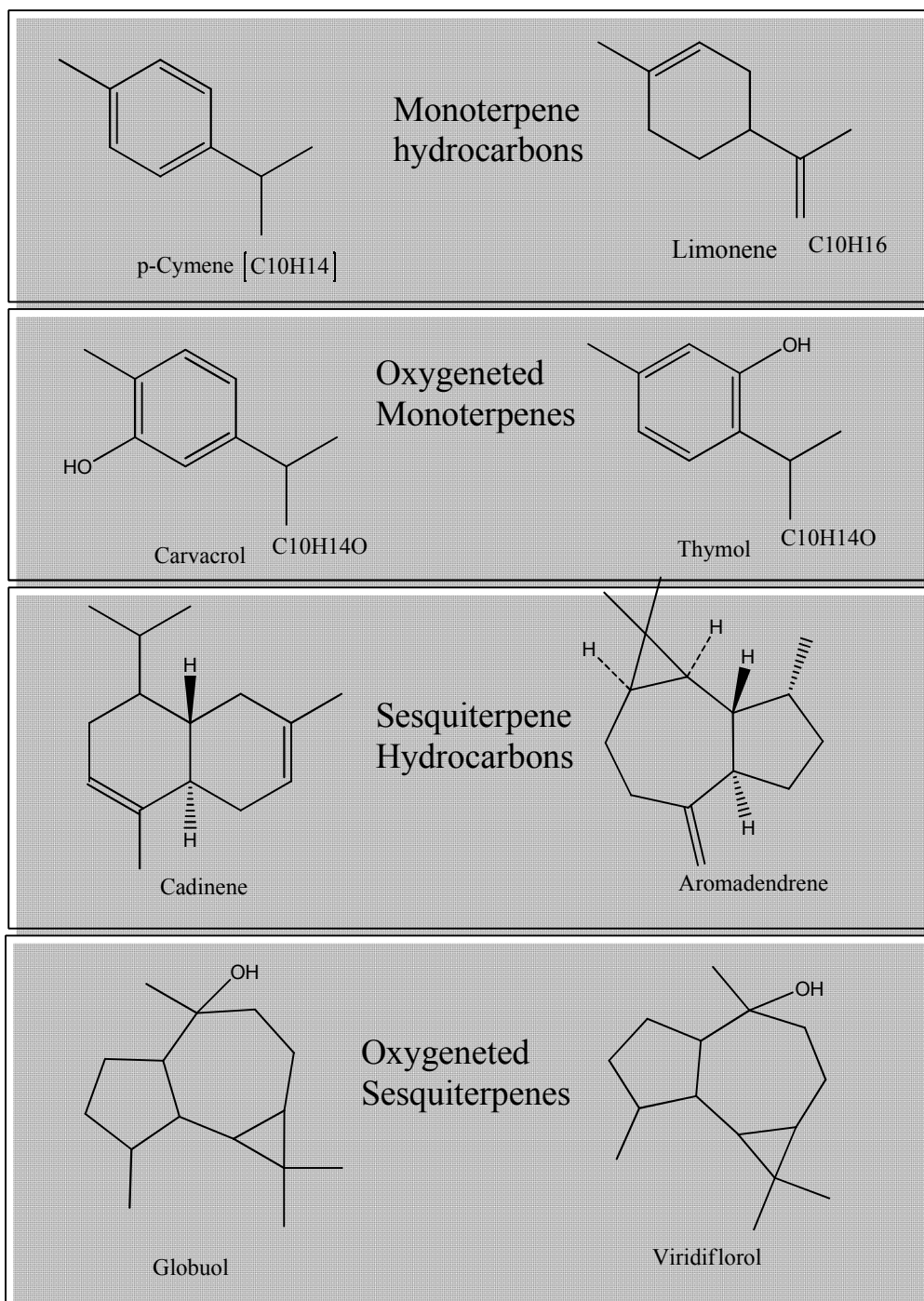


Figure 2: 2-C-methyl-D-erythritol-4-phosphate in plastids; isoprenoids synthesis from precursors (isopentenylpyrophosphate and dimethylallyl pyrophosphate) occurs in cytoplasm.

Figure 2 shows, Isoprenoid biosynthetic routes in plant cell: mevalonic pathway, in cytoplasm, and 2-C-methyl-D-erythritol-4-phosphate in plastids;

isoprenoids synthesis from precursors (isopentenylpyrophosphate and dimethylallyl pyrophosphate) occurs in cytoplasm.⁵

**Figure 3: Various Terpenoids**

Biogenic volatile compounds produced by plants include monoterpene and sesquiterpenes hydrocarbons, as well as oxygenated monoterpenes and sesquiterpenes, also referred to terpenes and terpenoids, respectively; these compounds are the main constituents of essential oils.⁵

The intracellular compartmentalization of terpene biosynthesis is still not known. It has been observed that at secretory stage GTs show highly developed smooth endoplasmic reticulum (SER), amoeboid leucoplasts, sometimes surrounded by periplasmic SER, with many plastid-SER membrane contacts.

These plastids showed the greatest changes during development and in relations to secretions, correlate strongly with monoterpenes in vivo, and can synthesize monoterpenehydrocarbons in vitro if fed with precursors (IPP and DMAPP). The close association, in secreting peltate GTs, of plastids, SER.^{6,7}

Mechanisms of Essential Oil Cytotoxicity

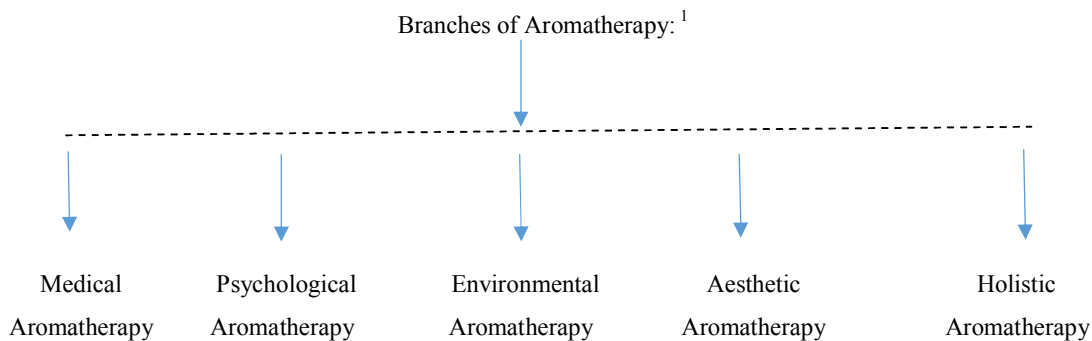
Essential oils are a complex mixture of molecules, which generally contains more than 20 different components of low molecular weight with very variable concentrations. In general, monoterpenes and sesquiterpenes are the main components of essential oils, though diterpenes and phenyl-propanoids can be present to a different extent. Many of these molecules are found in low concentrations, while few of them are the main components that can represent up to 70% of total oil and will be the main responsible for the biological effects of the oil. Until now, more than 3000 essential oils have been described, of which about one tenth are relevant for pharmaceutical, nutritional or cosmetic industries. Several essential oils have a strong interest in research for their cytotoxic capacity. Great efforts are performed in order to investigate the potential therapeutic effects of oils against several diseases especially those characterized by excessive cell growth and proliferation such as cancer or bacterial infections. The main mechanisms that mediate the cytotoxic effects of essential oils include the induction of cell death by activation of apoptosis and/or necrosis processes, cell cycle arrest, and loss of function of essential organelles. Several of these effects are attributable to the lipophilic nature and low molecular weight of the main components that comprise essential oils which allow them to cross cell membranes, alter membrane composition and increase membrane fluidity, leading to leakage of

ions and cytoplasmic molecules. Altering membranes lead to reduced ATP production, alteration of the pH gradient, and loss of mitochondrial potential that can result to the cell death. In addition, some essential oils may also act as pro-oxidant elements which can alter cellular redox state and also compromise cellular survival. The cytotoxic properties of essential oils result from the complex interaction between the different classes of compounds such as phenols, aldehydes, ketones, alcohols, esters, ethers or hydrocarbons. In addition, in some cases, the cytotoxic activity are closely related to few of the main components of the oils and, in this way, it has been reported that some of these isolated compounds exert considerable cytotoxic properties when have been tested individually. However, the wide variation in the chemical profile of essential oils means a great diversity in the mechanisms of action and molecular targets. Furthermore, because these oils consist of a wide variety of compounds, each compound can modulate or alter the effects of other ones.^{8, 9, and 10}

FROM AROMATHERAPY TO PHYTOTHERAPY:

Phytotherapy uses plant-derived medications in the treatment and prevention of disease. It is a science-based medical practice and thus is distinguished from other, more traditional approaches, such as medical herbalism, which relies on an empirical appreciation of medicinal herbs and which is often linked to traditional knowledge.^{2, 13}

There are various branches of Phytotherapy and Aromatherapy is one of them which uses fresh plants or plant extracts distilled using vapor to extract the essential oils, "the most active ingredients of plants." The oils are 70 times more potent than the plant from which they are extracted.^{2, 13}



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.^{1,2}

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.^{1,2}

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.^{1,2}

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.^{1,2}

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.^{1,2}

ESSENTIAL OIL CONTAINING PLANTS:

Eucalyptus

Eucalyptus [*Eucalyptus globules* Labill (*E. globulus*)] belonging to the family of Myrtaceae, is a long evergreen plant with a height up to 250 feet. It is known for its constituents like cineole (70%–85%), aromadendrene, limonene, cymene, etc. Its oils have been used to regulate and activate the various systems like nervous system for neuralgia, headache and debility. The immune system boosts the immunity against measles, flu, cold and chickenpox. Leucorrhoea and cystitis of genitourinary system can also be well treated with it. Throat infections, catarrh, coughs, bronchitis, asthma and sinusitis associated with respiratory system have been taken care of by oils of this plant.

Topical problems like wounds, cuts, burns, and herpes, and lice, insect repellent and insect bites can be treated with it. Treatment of rheumatoid arthritis, muscle and joint pains and aches is well reported from the essential oils of this plant. Eucalyptus oil has demonstrated its antioxidant, anti-inflammatory, anti-proliferative and



Figure 4: *E. globules* Labill.

Geranium

Geranium (*Pelargonium graveolens* L' Herit) belongs to the family of Geraniaceae (Figure 3). A perennial hairy shrub native of South Africa, up to one meter in height, also found and cultivated in France, Italy, Spain, Central America, Egypt, Japan and Congo is a plant of choice for essential oil. Eugenol, geranic, citronellol, geraniol, linalol (linalool), citronellylformate, citral, myrtenol, terpineol, methone and sabinene are the chemical constituents of its essential oil. One of the best natural perfume, complete in itself is geranium oil, generally used in soaps and detergents because its unique nature is never challenged with alkalinity of soaps. Hence, this oil is generally used to control the emotions in aroma therapy. It is used in dermatitis, eczema, aging skin, some fungal infections, along with anxiety and stress related problems. The oil has some anti-bacterial action and is an important ingredient for endometriosis treatment. This oil is further used for its sedative

antibacterial activities and researchers have proved its efficacy beyond doubt in treatment of various metabolic and infectious diseases. The results are promising and can be utilized for treatment of multifactorial diseases of various origins in humans.¹



Figure 5: *Pelargonium graveolens* L' Herit.

properties, nerve tonic, in throat infection, to rectify the blood disorder diabetes and for menopausal associated problems. Some reports are there about its supportive therapy in uterine and breast cancer, and it also certainly can help the patient in coping with the pain. People have used this as a flavouring agent for food stuff along with alcoholic and non-alcoholic beverages. It is an effective insect repellent. Moreover, this oil is gaining popularity as antidiabetic, anticancer, antibacterial and antimicrobial agent.^{4,11}

Lavender

Lavender (*Lavandula officinalis* Chaix.) belonging to the family of Lamiaceae, is a beautiful herb of the garden. It contains camphor, terpinen-4-ol, beta-ocimene, 1, 8-cineole, etc. Its constituent varies in concentration and therapeutic effects with the different species. Linalool and linalyl acetate have maximum and great absorbing properties during skin massage with a depression of CNS.

Linalool shows sedative effects and linalyl acetate shows marked narcotic actions. These two actions may be responsible for its use in lavender pillow anxiety patients with sleep disturbance pattern, improving the feeling of well-being, supporting mental alertness and suppressing aggression and anxiety. Lavender oil shows its antibacterial and antifungal properties against many species of bacteria, especially when antibiotics fail to work,



Figure 6: *Lavandula officinalis* Chaix.

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 l-limonene, together forming about 90 percent of the bulk of the oil. Traces of phellandrene, pinene and sesquiterpene are also present. 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. 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

but the exact mechanisms are yet to be established. When talking about its use in aromatherapy, it is well documented for the treatment of abrasions, burns, stress, headaches, in promotion of new cell growth, skin problems, painful muscles and boosting an immune system. This oil is used in the treatment of primary dysmenorrheal and has shown some promising results in one of the randomized, double-blind clinical trials.^{1,2,3}



Figure 7: *C. limon* Linn.

digestion, by forming carbonates and bicarbonates of potassium and calcium. A recently conducted double-blinded, randomized, controlled clinical trial study on aromatherapy has suggested that citrus oil is good in relieving the first stage labour pain. It is effective in controlling the nausea and vomiting along with its mood elevating properties.^{1, 2}

Peppermint

Peppermint [*Mentha piperita* Linn. (*M. piperita*)] belongs to the family of Lamiaceae. Till date, all the 600 kinds of mints are raised from 25 well-defined species. The two most important are peppermint (*M. piperita*) and spearmint (*Mentha spicata*). Spearmint bears the strong aroma of sweet character with a sharp menthol undertone. Its oil constituents include carvacrol, menthol, carvone, methyl acetate, limonene and menthone. The pharmacological action is due to menthol, a primary constituent of peppermint oil. At least 44% free menthol is present in peppermint oil.

Components are sensitive to climate, latitude and maturity of the plant. Inhalation and application of menthol on skin causes a skin reaction. It is used in many liniments dosage form to relieve pain spasms and arthritic problems. Peppermint oil is studied and documented for its anti-inflammatory, analgesic, anti-infectious, antimicrobial, antiseptic, antispasmodic, astringent, digestive, carminative, fungicidal effects, nervine stimulant, vasoconstrictor, decongestant and stomachic properties.¹



Figure 8: *M. piperita* Linn.

Roman chamomile

Roman chamomile (*Anthemis nobilis* Linn.) belongs to the family of Asteraceae. It is a plant for centuries with a potential to calm, moderate and strong emotions and it bears 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

The antispasmodic properties of oil make it a better choice during pain associated with the menstrual cycle and are also used in the treatment of irritable bowel syndrome. When superficially applied around the head and temple, it has very good action on headache. Further, itching due to various reasons like herpes blisters, ringworm infestation, scabies, poison oak, and ivy can also be relieved. It is observed that it can relieve many bacterial, fungal, and viral infections when inhaled or applied in the form of a vapor balm. Sinus and lung congestion are also known to be cleared by this oil.



Figure 9: *Anthemis nobilis* Linn.

aromatherapy, it is employed for its anxiolytic properties.

Its anti-anxiety and 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.¹

Rosemary

Rosemary (*Rosmarinus officinalis* Linn.) belonging

to the family of Lamiaceae bears small pale blue flowers in late spring/early summer and grows up to the height of 90 cm. It has three varieties (silver, gold and green stripe); it's the green variety that is used for its medicinal properties. This plant is rich in bitter principle, resin, tannic acid and volatile oil. The active constituents are bornyl acetate, borneol along with other esters and, special camphor similar to that possessed by the myrtle, cineol, pinene and camphene. Its oil has a marked action on the digestive system, with relieving the symptoms of indigestion, constipation and colitis. It works as liver and gall-bladder tonic. The oil also possesses some good action on the cardiovascular system. It regularizes the blood pressure and retards the hardening of arteries. In winter, it used to



Figure 10: *Rosmarinus officinalis* Linn.

Tea tree

Tea tree (*Melaleuca alternifolia* Cheel) belonging to the family of Myrtaceae, with yellow or purple flower and needles like leaves is a shrub of marshy area (Figure 11). Due to its commercial value, it is cultivated on plantations. The main constituent of its oil is terpinen-4-ol, an alcoholic terpene with a clean musty aroma. The antiviral activity is due to alpha-sabine with antibacterial and antifungal effects. It is an immune booster due to terpinen-4-ol while cineole is responsible for its antiseptic character. The tea tree itself possesses antibacterial, anti-inflammatory, antiviral, insecticidal, and immune stimulant properties. The aromatherapy

relieve the rheumatic pain which aggravates due to cold. Its stimulating properties on the nervous system have found to be beneficial in hysteria and paralysis. In latest human trials, aromatherapy is an efficacious non-pharmacological therapy for dementia and may have some potential for improving cognitive function, especially in Alzheimer's disease patients, due to its free radical scavenging activity. Excellent skin tonic properties, a soothing, positive effect on menstrual cramps, for hair growth are some of the other important properties of this oil. The other benefits of rosemary include a stimulant for the scalp encouraging hair growth and providing treatment for dandruff and greasy hair.¹



Figure 11: *Melaleuca alternifolia* Cheel.

utilizes the mixture of lemon, blue gum, clary sage, eucalyptus, lavender, rosemary, ginger and Scotch pine for treatment of different ailments. The oil is used in herpes, abscess, blisters, acne, cold sores, burns, insect bites, dandruff and oily skin. Further, in treatment of respiratory associated problems it has been used for tuberculosis, cough, bronchitis, asthma, catarrh and whooping cough; also it is used in females for vaginitis, cystitis and pruritus treatment. Cold, fever, flu and chickenpox have called for its use. Well defined studies have been carried out on *Melaleuca alternifolia* (tea tree) on herpes through clinical trial efforts with a promising result of this plant.¹

YlangYlang

Ylang-ylang (*Cananga odorata* Hook. F. &Thoms) belonging to the family of Annonaceae, native to Madagascar, Indonesia and Philippines is a small tree (Figure 12). Its chemical constituent includes geranyl acetate, linalol, geraniol, farnesol, benzyl acetate, geranial, methyl chavicol, beta-caryophyllene, eugenol, pinene and farnesene. The best property of this tree is to retard the heart beat and rapid breathing with perfect use in shock and trauma situations. It is antidepressive in nature with euphoric properties, thus giving the feeling of well-being. Low self-esteem and women suffering from

the post-menopausal syndrome have better results on them. A pilot study involving 34 professionals from a nursing group was carried out in Portugal to verify the use of ylangylang essential oil in relieving the anxiety and increasing the self-esteem along with alteration of blood pressure and temperature. The results showed clear evidence that use of this plant led to a significant alteration in self-esteem. Further, its aphrodisiac properties are due to its exotic fragrance advantageous for both dry and oily skins. It is also indicated in depression, anxiety, hypertension, frigidity, stress and palpitations.^{1, 12}



Figure 12: *Cananga odorata* Hook. F. &Thoms.

Properties of Essential oils:

The Skin

Skin problems are often the surface manifestation of a deeper condition, such as a build-up of toxins in the blood, hormonal imbalance or nervous and emotional difficulties. In this area the versatility of essential oils is particularly valuable because they are able to combat such complaints on a variety of levels.

- *Antiseptics* for cuts, insect bites, spots, etc.; for example, thyme, sage, eucalyptus, tea tree, clove, lavender and lemon.
- *Anti-inflammatory* oils for eczema, infected wounds, bumps, bruises, etc.; for example, German and Roman chamomile, lavender and yarrow.
- *Fungicidal* oils for athletes foot, candida, ringworm, etc.; for example, lavender, tea tree, myrrh, patchouli and sweet marjoram.
- *Granulation* stimulating or cicatrising(healing) agents for burns, cuts, scars, stretch marks, etc.; for example, lavender, chamomile, rose, neroli, frankincense and geranium.
- *Deodorants* for excessive perspiration, cleaning wounds, etc.; for example, bergamot, lavender, thyme, juniper, cypress, Spanish sage, lemongrass.
- *Insect repellents* for lice, fleas, scabies, ticks, mosquitos, ants, moths, etc.; for example, spike lavender, garlic, geranium,

citronella, eucalyptus, clove, camphor, and Atlas cedar wood.^{3,4}

The Circulation, Muscles and Joints

Essential oils are easily absorbed via the skin and mucosa into the bloodstream, affecting the nature of the circulation as a whole. Oils with a warming effect not only cause a better local blood circulation, but also influence the inner organs. They bring a warmth and glow to the surface of the skin and can provide considerable pain relief through their analgesic or numbing effect. Such oils can relieve local inflammation by setting free mediators in the body which in turn cause the bloodvessels to expand, so the blood is able to move more quickly and the swelling is reduced. Some oillike hyssop tend to have a balancing or regulating effect on the circulatory system as a whole, reducing the blood pressure if it is too high or stimulating the system if it is sluggish.

- *Hypotensives* for high blood pressure, palpitations, stress, etc.; for example, sweet marjoram, ylangylang, lavender, lemon.
- *Hypertensives* for poor circulation, chilblains, listlessness, etc.; for example, rosemary, spike lavender, eucalyptus, peppermint, thyme.
- *Rubefacients* for rheumatism of the joints, muscular stiffness, sciatica, lumbago, etc; for example, black pepper, juniper, rosemary, camphor, sweet marjoram.
- *Depurative or antitoxic agents* for arthritis, gout, congestion, skin eruptions, etc.; for example, juniper, lemon, fennel, etc.
- *Lymphatic stimulants* for cellulitis, obesity, water retention, etc.; for example, grapefruit, lime, fennel, lemon, mandarin, white birch.

- *Circulatory tonics and astringents* for swellings, inflammations, varicose veins, etc.; for example, cypress, yarrow, lemon.^{2,3}

The Respiratory System

Nose, throat and lung infections are conditions which respond very well to treatment with essential oils. Inhalation is a very effective way of utilizing their properties. In addition, most essential oils which are absorbed from the stomach are then excreted via the lungs, only a small part in the urine.

- *Expectorants* for catarrh, sinusitis, coughs, bronchitis, etc; for example, eucalyptus, pine, thyme, myrrh, sandalwood, fennel.
- *Antispasmodics* for colic, asthma, dry cough, whooping cough, etc; for example, hyssop, cypress, cedarwood, bergamot, chamomile, etc.
- *Balsamic agents* for colds, chills, congestion, etc; for example, benzoin, frankincense, Tolu balsam, Peru balsam, myrrh.
- *Antiseptics* for 'flu, colds, sore throat, tonsillitis, gingivitis, etc; for example, thyme, sage, eucalyptus, hyssop, pine, cajeput, tea tree, borneol.^{3,4}

The Digestive System

Although it is not recommended that essential oils be taken orally, they can by external application effect certain changes in the digestive processes. However, whereas herbal medicine has many remedies at its disposal for a wide variety of stomach, gall bladder and liver complaints, such as dandelion, marshmallow, chamomile and meadowsweet, much of their effectiveness is based on a combination of aromatic components, together with bitters, tannins and mucilage, which are absent in the volatile oil alone. The external application of

essential oils in problems of the digestive system though effective, is consequently somewhat limited compared to the internal use of herbal remedies.

- *Antispasmodics* for spasm, pain, indigestion, etc.; for example, chamomile, caraway, fennel, orange, peppermint, lemon balm, aniseed, cinnamon.
- *Carminatives and stomachics* for flatulent dyspepsia, aerophagia, nausea, etc.; for example, angelica, basil, fennel, chamomile, peppermint, mandarin.
- *Cholagogues* for increasing the flow of bile and stimulating the gall bladder; for example, caraway, lavender, peppermint and borneol.
- *Hepatics* for liver congestion, jaundice, etc; for example, lemon, lime, rosemary, peppermint.
- *Aperitifs* for loss of appetite, anorexia, etc; for example, aniseed, angelica, orange, ginger, garlic.³

The Genito-urinary and Endocrine Systems

Like the digestive system, the reproductive organs can be affected by absorption via the skin into the bloodstream, as well as through hormonal changes. Some essential oils such as rose and jasmine have an affinity for the reproductive system having a general strengthening effect as well as helping to combat specific complaints like menstrual problems, genital infections and sexual difficulties. Other oils contain plant hormones which mimic the corresponding human hormones; oils such as hops, sage and fennel have been found to contain a form of oestrogen that influences the menstrual cycle, lactation and secondary sexual characteristics. Oestrogen also helps maintain a healthy circulation, good muscle and skin tone and strong bones in both men and women.

Other essential oils are known to influence the levels of hormone secretion of other glands, including the thyroid gland (which governs growth and metabolism), the adrenal medulla (which deals with stress reactions) and the adrenal cortex (which governs several processes including the production of oestrogen and androgen, the male sex hormone).

- *Antispasmodics* for menstrual cramp (dysmenorrhoea), labour pains, etc.; for example, sweet marjoram, chamomile, clary sage, jasmine, lavender.
- *Emmenagogues* for scanty periods, lack of periods (amenorrhoea), etc; for example, chamomile, fennel, hyssop, juniper, sweet marjoram, peppermint.
- *Uterine tonics and regulators* for pregnancy, excess menstruation (menorrhagia), PMT, etc; for example, clary sage, jasmine, rose, myrrh, frankincense, lemon balm.
- *Antiseptic and bactericidal agents* for leucorrhoea, vaginal pruritis, thrush, etc; for example, bergamot, chamomile, myrrh, rose, tea tree.
- *Galactagogues* for increasing milk flow; for example, fennel, jasmine, anise, lemongrass (sage, mint and parsley reduce it).
- *Aphrodisiacs* for impotence and frigidity, etc; for example, black pepper, cardamon, clary sage, neroli, jasmine, rose, sandalwood, patchouli, ylangylang.
- *Anaphrodisiacs* for reducing sexual desire; for example, sweet marjoram, camphor.
- *Adrenal stimulants* for anxiety, stress-related conditions, etc.; for example, basil, geranium, rosemary, borneol, sage, pine, savory.

- *Urinary antiseptics* for cystitis, urethritis, etc; for example, bergamot, chamomile, tea tree, sandalwood.^{2,3,4}

The Immune System

Virtually all essential oils have bactericidal properties and by promoting the production of white blood cells, they can help prevent and treat infectious illness.

- *Bactericidal and antiviral agents (prophylactics)* for protection against colds, 'flu, etc.; for example, tea tree, cajeput, niaouli, basil, lavender, eucalyptus, bergamot, camphor, clove, rosemary.
- *Febrifuge agents* for reducing fever and temperature, etc; for example, angelica, basil, peppermint, thyme, sage, lemon, eucalyptus, tea tree.
- *Sudorifics and diaphoretics* for promoting sweating, eliminating toxins, etc; for example, rosemary, thyme, hyssop, chamomile.^{3,4}

The Nervous System

Recent research shows that the properties of many oils correspond to the traditionally held views: chamomile, bergamot, sandalwood, lavender and sweet marjoram were found to have a sedative effect on the central nervous system; jasmine, peppermint, basil, clove and ylangylang were found to have a stimulating effect. Neroli was found to be stimulating and lemon to be sedating, contrary to popular belief. Some oils are known to be 'adaptogens', that is, they have a balancing or normalizing effect on the systems of the body: geranium and rosewood were either sedative or stimulating according to each situation and individual.

- *Sedatives* for nervous tension, stress, insomnia, etc; for example, chamomile, bergamot, sandalwood, lavender, sweet

marjoram, lemon balm, hops, valerian, lemon.

- *Stimulants* for convalescence, lack of strength, nervous fatigue, etc; for example, basil, jasmine, peppermint, ylangylang, neroli, angelica, rosemary.
- *Nerve tonics (nervines)* for strengthening the nervous system as a whole; for example, chamomile, clary sage, juniper, lavender, marjoram, rosemary.^{3,6,7}

The Mind

This area is perhaps the most discussed and least understood area of activity regarding essential oils. There is no doubt that throughout history aromatic oils have been used for their power to influence the emotions and states of mind: this is the basis for their employment as incense for religious and ritualistic purposes. It is already known that two olfactory nerve tracts run right into the limbic system (the part of the brain concerned with memory and emotion), which means that scents can evoke an immediate and powerful response which defies rational analysis.

Recent research at Warwick University, England, and Toho University, Japan, has aimed to put these traditionally held beliefs and applications into a scientific context. They came up with two types of reaction to odours which they called a 'hard-wired' response or a 'soft-wired' response: the first type is ingrained from before birth and is purely instinctual; the second is learned or acquired later on.

- The first type may be, for example, the scent of the mother's skin or a sexual signal; the second might be the fragrance of honeysuckle, reminiscent of a childhood garden.

But to what extent is the effect of a particular oil dependent upon its chemical or physiological make-up, and to what extent does it rely upon a

belief or an association? In dealing with the psychological or emotional responses to the scent of a particular oil, this kind of classification becomes much more difficult: surely here it is more appropriate to consider the temperament of each individual within a given context, rather than predict a set reaction.

At the Psychology of Perfumery Conference 1991, it was generally agreed that 'while pharmacological effects may be very similar from one person to another, psychological effects are bound to be different.' The effect of an odour on a human being was dependent on a variety of factors which include:

1. How the odour was applied,
2. How much was applied,
3. The circumstances in which it was applied,
4. The person to whom it was applied (age, sex, personality type),
5. What mood they were in to start with,
6. What previous associations they may have with the odour,
7. Anosmia, or inability to smell (certain scents).

We must, therefore, seek odoriferous substances which present affinities with the human being we intend to treat, those which will compensate for his deficiencies and those which will make his faculties blossom. It was by searching for this remedy that we encountered the

individualprescription (IP), which on all points represents the identity of the individual.

When we begin to consider individual needs, essential oils start to demonstrate the versatility of their nature. The rose is a good example; a flower which has been associated with beauty, love, and spiritual depth in folklore and religious texts (especially Sufi) but which also has a long tradition of usage for physical conditions such as skin problems, regulating the female cycle, promoting the circulation, purifying the blood and as a heart tonic. When we smell the fragrance of the rose, it carries all these rich associations with it, affecting our mind and body simultaneously, where the effect is moulded by personal experience.^{3,6,7}

Anti-tumor& Anti-Cancer activity:

Tea tree oil and terpinen-4-ol both were able to retard the growth of human melanoma M14 WT cells and M14 adriamicin-resistant 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. Efforts are being made to establish the link between essential oils and their anti-tumor activity. Polypharmacological anti-tumor mode-of-action of essential oils in cardamom has some promising results to substantiate the claims.

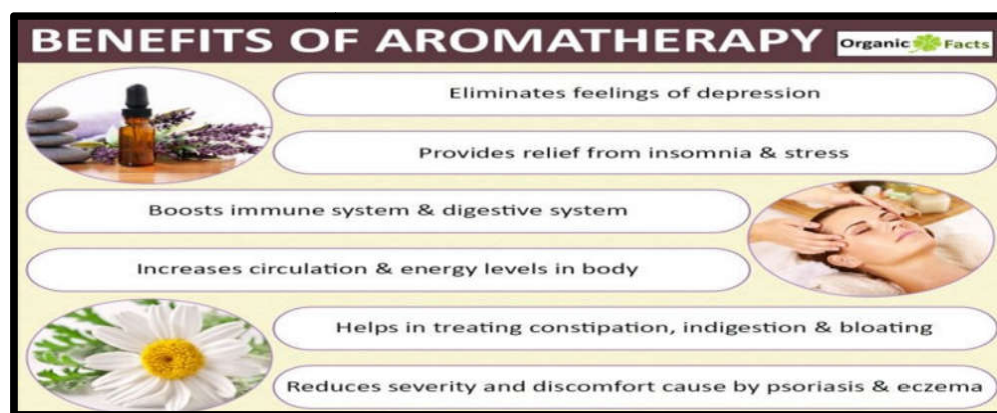


Figure 13: Benefits of Aromatherapy

Applications of Aromatherapy:

The use of aromatherapy in holistic medicine has taken a long leap within a couple of years. On reviewing the literature on this therapy, it is found that numerous studies have been carried out to study the effects of this therapy on human brain and its emotions.

Its role in mood, alertness, and mental stress in healthy subjects was a topic of discussion among scientific community recently. The health benefits of aromatherapy include its ability to relieve anxiety and depression, boost energy levels, speed up the healing process, cure headaches, boost cognition, induce sleep, strengthen the immune system, reduce pain, improve digestion, and increase circulation.

- Aromatherapy is not widely administered via ingestion.
- The effects of aromatherapy are theorized to result from the binding of chemical components in the essential oil to the olfactory receptor, impacting the brain's emotional centre, the limbic system. Topical application of aromatic oils may exert antibacterial, anti-inflammatory, and analgesic effects. Studies in animals show sedative and stimulant effects of specific essential oils as well as positive effects on behaviour and the immune system. Functional imaging studies in humans support the influence of odours on the limbic system and its emotional pathways. Human clinical trials have investigated aromatherapy

primarily in the treatment of stress and anxiety in patients with critical illnesses or in other hospitalized patients.

These oils have well proven antibacterial, antibiotic, and antiviral properties and many published reports elsewhere as well as practitioners have suggested them to be useful in many other diseases like alzheimer, cardiovascular, cancer and labour pain in pregnancy, etc. There is an increased trend nowadays to use this therapy in the treatment of cancer and sleep disorder. Their organic character and to act in a supportive manner with the body, provide a feeling of well-beingness. It was found that the locomotor activity of mice increased significantly by inhalation of rosemary essential oils, which are used in phytotherapy as activating and refreshing remedy for exhaustion.

CONCLUSION:

“Imagine a survivor of a failed civilization with only a tattered book on Aromatherapy for guidance in arresting a cholera epidemic. Yet, such a book would more likely be found amid the debris than a comprehensible medical text.” - James Lovelock, Environmentalist & Scientist.

Aromatherapy is not only having the ability to cure several diseases but also use of essential oils provides pleasure & soothing effect. Hence, Aromatherapy is an Art of Healing & has similar benefits, when used with the Modern Treatment Techniques.

REFERENCES:

1. Ali B, Wabel N.A.A, Shams S, Ahamad A, Khan S.A, Anwar F. Essential oils used in aromatherapy: A systemic review. *As. Paci. J. Trop. Med.*, 2015, 5(8), 601-611.
2. <http://healinghandsschool.com/wp-content/uploads/2013/06/Aroma-Day1-Part1.pdf>
3. <http://www.aaimt.edu/lc/Courses/EssOils/EssentialOils.pdf>
4. <http://redwheelweiser.com/downloads/encyclopediassoils.pdf>
5. www.mdpi.com/1420-3049/22/1/70/pdf
6. Bakkali, F.; Averbeck, S.; Averbeck, D.; Idaomar, M. Biological effects of essential

- oils—A review. *Food Chem. Toxicol.* **2008**, 46, 446–475. [[CrossRef](#)] [[PubMed](#)]
7. Zitzelsberger, C.; Buchbauer, G. Essential oils as “a cry for help”. A review. *Nat. Prod. Commun.* **2015**, 10, 1127–1138. [[PubMed](#)]
8. Freires, I.A.; Denny, C.; Benso, B.; de Alencar, S.M.; Rosalen, P.L. Antibacterial activity of essential oils and their isolated constituents against cariogenic bacteria: A systematic review. *Molecules* **2015**, 20, 7329–7358. [[CrossRef](#)] [[PubMed](#)]
9. Russo, R.; Corasaniti, M.T.; Bagetta, G.; Morrone, L.A. Exploitation of cytotoxicity of some essential oils for translation in cancer therapy. *Evid. Based Complement. Alternat. Med.* **2015**, 2015, 397821. [[CrossRef](#)] [[PubMed](#)]
10. Bayala, B.; Bassole, I.H.; Scifo, R.; Gnoula, C.; Morel, L.; Lobaccaro, J.M.; Simpore, J. Anticancer activity of essential oils and their chemical components—A review. *Am. J. Cancer Res.* **2014**, 19, 591–607.
11. R. Tisserand, T. Balacs, *Essential oil safety: a guide for health professionals* Churchill Livingstone, Edinburgh (1995).
12. W.C. Evans Trease and Evans *pharmacognosy* (4th ed.), WB Saunders Co, London (2000).
13. <https://www.britannica.com/science/phytotherapy>

CONFLICT OF INTEREST REPORTED: NIL ;

SOURCE OF FUNDING: NIL