Review Article **ISSN: 2321 – 0915**

Asian journal of Phytomedicine and Clinical Research

Journal home page: www.ajpcrjournal.com

AROMATHERAPY: THE ESSENCE SCIENCE FOR SOCIAL HEALTH STATUS

P. V. Powar[*1], A. N Lomkhade[1], R. B. Ambikar[1], P. H. Sharma[1], N. S. Vyawahare[1]

[*1]Department of Pharmaceutics, Padmashree Dr. D.Y. Patil College of Pharmacy, Akurdi, Pune - 411044, India.

ABSTRACT

Aromatherapy is a form of complementary and alternative medicine that uses volatile liquid plant materials known as Essential Oil, Phytoncides and other natural organic compounds rich in monoterpenes, sesquiterpenes, as well as other natural volatile organic compounds (esters, aromatic compounds, non-terpene hydrocarbons, some organic sulfides etc.).Ethereal Oils used to treat or manage mood disorder and improve quality of life. Volatile Oils create favorable conditions within the mind, body and spirit in order that a natural balance can be restored and energy renewed. Aetherolea are derived from different plant parts, having different composition compared to other herbal products because distillation process recovers only lighter phytomolecules, it activates limbic system and emotional center of brain, stimuli body to heal itself. The present paper enumerates the various aspects of aromatherapy.

KEYWORDS

Phytoncides, Aetherolea, Phytomolecules and Aromatherapy.

Author for correspondence:
P. V. Powar
Department of Pharmaceutics,
Pad. Dr D Y Patil College of Pharmacy,
D. Y. Patil Education Complex, Sec No. 29,
Akurdi, Pune - 411 044.

E mail: priyatama.powar@gmail.com.

INTRODUCTION

The term aromatherapy was first coined in 1920s by French chemist Rene Maurice Gattefosse, who devoted his life to researching the healing properties of essential oils after a lucky accident in his perfume laboratory[1]. Aromatherapy, commonly coupled with complementary and alternative medicine (CAM), is the use of volatile liquid plant materials, known as essential oils (EOs): different composition compared to other herbal products because the distillation used in aromatherapy recovers the lighter phytomolecules which absorbed through the skin or inhaled, and other aromatic compounds from plants to affect mood or health. It gently stimuli body to

heal itself. Many consider this type of treatment as unscientific and wishful thinking - however, scientific evidence of its effectiveness is growing[2, 3]. The world health organization has recently (2002-2005) launched a complimentary alternative medicine strategy to look into the widespread use of aromatherapy by medical practitioners all over the world. According to Van der Watt and Janca (2008), the use of CAM in the treatment of people with mental health problems in the western world has prompted much debate. They were of the opinion that aromatherapy is one of the fastest growing CAM therapies. According to WHO traditional medicine is widely used and of rapidly growing health system and economic importance. In Africa up to 80% of the population use traditional medicine to help meet their health care needs. In Asia and Latin America, population continues to use traditional medicine as a result of historical circumstances and cultural beliefs. In China traditional medicine accounts for 40% of all health care delivered. And in many developed countries CAM is becoming more and more popular in Figure No.1.

HISTORY

Historically aromatherapy has been used for thousands of years for healing and spiritual rituals. The Ancient Egyptians have documented their utilization of natural oils from around 3,500 BC, were the first recorded users of aromatherapy oils, although they initially used them for different purposes like embalming the bodies of the dead, for which they used oils such as cinnamon and cedarwood. Through this practice they discovered that these oils could also be used successfully as perfumes, and they eventually began using them during healing rituals to calm patients. Some of the ingredients that Egyptians used therapeutically were spikenard, frankincense, citrus fruits, myrrh, oregano, and cedar. Some scholars believe that a spikenard ointment may have been used by Mary Magdalen to anoint the feet of Christ prior to the Last Supper [4].

In the traditional Chinese system, they make use of sophisticated pharmacology based on the Five Element theory, and the energetic classifications, is strongly reminiscent of the Ancient Indian School of medicine. The Chinese use daroma therapy oils primarily medicinally, but also burned the oils as part of religious tribute rituals. The Chinese were the first to expand the usage of these oils into other areas of alternative medicine, such as acupressure. They also bured aromatherapy oils when performing massase therapy.

In ancient India, essential oils and incense were used in Ayurveda, the indigenous system of medicine, has used floral and other herbal essences for thousands of years. Ayurvedic practitioners abundantly utilized herbal essences for both psychological and physical ailments, in count to incense aromatherapy. According to Ayurveda, an individual's qualities are synchronized when the inherent qualities of various medicinal herbs and flowers are introduced. According to Ayurveda, herbal ingredients may be organized as natural incense, and used to avert infections, purify one's environmental atmosphere, and energize the vital life airs of the body[5].

Aroma therapy in Europe can be traced back to the Greeks and Romans, who used essential oils for various medicinal purposes. Greek physician Asclepius is the first recorded practitioner of extensive medicinal aromatherapy. The use of fumigation aroma therapy was measured to be of principal importance as far back as the time of Hippocrates. Around 450 BCE, Hippocrates developed this practice further and recommended the use of aromatic oils in baths to help patients of rheumatism and arthritis. Two principle methods of administering the healing systems are fumigation and inhalation are easily achieved through the use of herbal scents. Daily use of incense helped prevent disease, promotes a longer life, harmonize one's psycho-physical constitution, and increases mental clarity [6].

Theory

Aromatherapy is a holistic treatment that is used to care for the body by using pleasant smelling botanical oils and aromatic plant compounds in Figure No.2.

Aromatherapy requires an enormously high quality of essential oils which have a direct pharmacological effect. Aromatherapists claim, there is a synergy between the body and aromatic oils; however there is no scientific proof that this is the case. Essential oils, phytoncides and other natural volatile organic compounds (VOCs) work differently in Figure No.3 and 4. When targeting our sense of smell they activate the limbic system and emotional centers of the brain When applied topically (onto the skin) they activate thermal receptors and destroy microbes and fungi. Internal application may stimulate the immune system 8, 9.

EO's applied to the skin (commonly in form of massage oils i.e. 1-10% solutions of EO in carrier oil) they activate thermal receptors, and kill microbes and fungi. Internal application of essential oil preparations (mainly in pharmacological drugs; generally not recommended for home use apart from dilution - 1-5% in fats or mineral oils, or hydrosoles) may stimulate the immune system, urine secretion, may have antiseptic activity etc. Different essential oils have very different activity; they are studied in Aromachology. Essential oils have high antioxidant properties which control free radical damage at the cellular level and supports youthful aging and a healthy body

Chemo type in essential oil, such as Eucalyptus globulus (main component is 1, 8 cineole), Eucalyptus citriodora (citral), Eucalyptus menthol, and others. Properties of the essential oils of the same generic (common) name are not all the same; they can differ widely in their chemical components and in their therapeutic actions. Likewise, their chemical makeup depends on the method of extraction (e.g. pressed and distilled bergamot oil have different uses) [10].

Biological aspects

The effects are thought to be due to the compounds entering the body and acting directly on the brain, i.e. via the bloodstream by absorption through the lungs or olfactory mucosa. That aromatherapy might have its effects in the absence of any psychological perception of the smell is important, since many people with dementia may be anosmic because of the early loss of olfactory neurons. Further, a 2002 study in the Journal of Clinical Psychiatry showed a 35% improvement in agitation, most often exhibited in decreased signs of restlessness and shouting when using aromatherapy in Alzheimer's patients [11].

Sources of natural essential oil

Essential oils are generally derived from one or more plant parts, such as flowers (e.g.rose, jasmine, carnation, clove, mimosa, rosemary, lavander), leaves (e.g. mint, *Ocimum*spp., lemongrass, jamrosa), leaves and stems (e.g. geranium, patchouli, petitgrain, verbena, cinnamon), bark (e.g. cinnamon, cassia, canella), wood (e.g. cedar, sandal, pine), roots (e.g.angelica, sassafras, vetiver, saussurea, valerian), seeds (e.g fennel, coriander, caraway, dill, nutmeg), fruits (bergamot, orange, lemon, juniper), rhizomes (e.g. ginger, calamus, curcuma, orris) and gums or oleoresin exudations (e.g. balsam of Peru, *Myroxylonbalsamum*, storax, myrrh, benzoin).

Extraction Methods of Natural Essential Oils [12, 13, 14]

Essential oils are used in a wide variety of consumer goods such as detergents, soaps, toilet products, cosmetics, pharmaceuticals, perfumes, confectionery food products, soft drinks, distilled alcoholic beverages (hard drinks) and insecticides. The world production and consumption of essential oils and perfumes are increasing very fast. Production technology is an essential element to improve the overall yield and quality of essential oil. The traditional technologies pertaining to essential oil processing are of great significance and are still being used in many parts of the globe. Water distillation, water and steam distillation, steam distillation, cohobation, maceration and enfleurage are the most traditional and commonly used methods. Maceration is adaptable when oil yield from distillation is poor. Distillation methods are good for powdered almonds, rose petals and rose blossoms, whereas solvent extraction is suitable for expensive, delicate and thermally unstable materials like jasmine, tuberose, and hyacinth. Water distillation is the most favoured method of production of citronella oil from plant material in Figure No.5.

Hydro diffusion

Diffusion of essential oils and hot water through plant membranes is known as Hydro diffusion. In steam distillation, the steam does not actually penetrate the dry cell membranes. Therefore, dry plant material can be exhausted with dry steam only when all the volatile oil has been freed from the oil-bearing cells by first thorough combination of the plant material. But, when the plant material is soaked with water, exchange of vapours within the tissue is based on their permeability while in swollen condition. Membranes of plant cells are almost impermeable to volatile oils. Therefore, in the actual process, at the temperature of boiling water, a part of volatile oil dissolves in the water present within the glands, and this oil-water solution permeates, by osmosis, the swollen membranes and finally reaches the outer surface, where the oil is vaporized by passing steam. Another aspect of hydro diffusion is that the speed of oil vaporization is not influenced by the volatility of the oil components, but by their degree of solubility in water. Therefore, the high-boiling but more water-soluble constituents of oil in plant tissue distilled before the low boiling but less water-soluble constituents. Since hydro diffusion rates are slow, distillation of uncommented material takes longer time than commented material.

Hydrolysis

Hydrolysis in the present context is defined as a chemical reaction between water and certain constituents of essential oils. Esters are constituents of essential oils and, in the presence of water, especially at high temperatures; they tend to react with water to form acids and alcohols. However, the reactions are not complete in either direction and the relationship between the molar concentrations of various constituents at equilibrium is written as:

$$K = \frac{(\text{Alcohol}) \times (\text{Acid})}{(\text{Ester}) \times (\text{Water})}$$

Where K is the equilibrium constant.

Therefore, if the amount of water is large, the amounts of alcohol and acid will also be large, resulting in a decreased yield of essential oil. Furthermore, since this is a time-dependent reaction, the extent to which hydrolysis proceeds depends on the time of contact between oil and water. This is one of the disadvantages of water distillation.

Effect of Heat

To obtain the best quality oil, distillation must be done at low temperatures. The temperature in steam distillation is determined entirely by the operating pressure, whereas in water distillation and in water and steam distillation the operating pressure is usually atmospheric. The rate of diffusion usually increases with temperatures as does the solubility of essential oils in water. The same is true for the rate and extent of hydrolysis. However, it is possible to obtain better yield and quality of oils by: (1) maintaining the temperature as low as possible, (2) using as little water as possible, in the case of steam distillation, and (3) thoroughly comminuting the plant material and packing it uniformly before distillation.

Hydro distillation

In order to isolate essential oils by hydro distillation, the aromatic plant material is packed in a still and a sufficient quantity of water is added and brought to a boil; alternatively, live steam is injected into the plant charge. Due to the influence of hot water and steam, the essential oil is free from the oil glands in the plant tissue. The vapour mixture of water and oil is condensed by indirect cooling with water. From the condenser, distillate flows into a separator, where oil separates automatically from the distillate water Figure No.6.

Water Distillation

In this method, the material is completely immersed in water, direct contact between boiling water and plant material, which is boiled by applying heat by direct fire, steam jacket, closed steam jacket, closed steam coil or open steam coil. The plant material in the must be agitated as the water boils, otherwise agglomerations of dense material will settle on the bottom and become thermally degraded. Certain plant materials like cinnamon bark, which are rich in mucilage, must be powdered so that the charge can readily disperse in the water; as the temperature of the water increases, the mucilage will be leached from the ground cinnamon. This greatly increases

the viscosity of the water-charge mixture, thereby allowing it to char. From this laboratory trial, the yield of oil from a known weight of the plant material can be determined. The laboratory apparatus recommended for trial distillations is the Clevenger system in Figure No.7.

Water distillation possesses advantages like

- It permits processing of finely powdered material or plant parts that, by contact with live steam, would otherwise form lumps through which the steam cannot penetrate.
- Inexpensive method, easy to construct and suitable for field operation.

The main disadvantage of water distillation is that complete extraction is not possible. Besides, certain esters are partly hydrolyzed and sensitive substances like aldehydes tend to polymerize. Water distillation requires a greater number of stills, more space and more fuel. It demands considerable experience and familiarity with the method. The high-boiling and somewhat water-soluble oil constituents cannot be completely vaporized or they require large quantities of steam. Thus, the process becomes uneconomical. For these reasons, water distillation is used only in cases in which the plant material by its very nature cannot be processed by water and steam distillation or by direct steam distillation.

Traditional Method of Producing Attar Using Hydro distillation Floral attars are defined as the distillates obtained by hydro distillation of flowers (such assaffron, marigold, rose, jasmine, pandanus) in sandal wood oil or other base materials like paraffin. Attar manufacturing takes place in remote places because the flowers must be processed quickly after collection. The apparatus and equipment used to manufacture attar are light, flexible, easy to repair, and have a fair degree of efficiency. Keeping in view these facts, thetraditional “deg and bhapka” process has been used for centuries and is used even now with the following traditional equipment.

- Deg (still)
- Bhapka (receiver)
- Chonga (bamboo condenser)
- Traditional bhatti (furnace)
- Gachchi (cooling water tank)
- Kuppi (leather bottle)

Disadvantages of Water Distillation

- Oil components like esters are sensitive to hydrolysis while others like acyclic monoterpene hydrocarbons and aldehydes are susceptible to polymerization (since the pH of water is often reduced during distillation, hydrolytic reactions are facilitated).
- Oxygenated components such as phenols have a tendency to dissolve in the still water, so their complete removal by distillation is not possible.
- As water distillation tends to be a small operation (operated by one or two persons), it takes a long time to accumulate much oil, so good quality oil is often mixed with bad quality oil.
- The distillation process is treated as an art by local distillers, who rarely try to optimize both oil yield and quality.

Water and Steam Distillation

In water and steam distillation, the steam can be generated either in a satellite boiler or within the still, although separated from the plant material. Also, the equipment used is generally similar to that used in water distillation, but the plant material is supported above the boiling water on a perforated grid which is fashioned so that the plant material is raised above the water which reduces the capacity of the still but affords a better quality of oil. If the amount of water is not sufficient to allow the completion of distillation, a cohobation tube is attached and condensate water is added back to the still manually, thereby ensuring that the water, which is being used as the steam source, will never run out which control the loss of dissolve doxygenated constituents in the condensate water because the re-used condensate water will allow it to become saturated with dissolved constituents, after which more oil will dissolve in it shown in Figure No.8.

Advantages of Water and Steam Distillation over Water Distillation as follows:

- Higher oil yield.
- Components of the volatile oil are less susceptible to hydrolysis and polymerization (the control of wetness on the bottom of the still

affects hydrolysis, whereas the thermal conductivity of the still walls affects polymerization).

- If refluxing is controlled, then the loss of polar compounds is minimized.
- Oil quality produced by steam and water distillation is more reproducible.
- Steam and water distillation is faster than water distillation, so it is more energy efficient. Many oils are currently produced by steam and water distillation, for example lemongrass is produced in Bhutan with a rural steam and water distillation system.

Disadvantages of Water and Steam Distillation:

- Due to the low pressure of rising steam, oils of high-boiling range require a greater quantity of steam for vaporization -hence longer hours of distillation.
- The plant material becomes wet, which slows down distillation as the steam has to vaporize the water to allow it to condense further up the still.
- To avoid that the lower plant material resting on the grid becomes waterlogged, a baffle is used to prevent the water from boiling too vigorously and coming in direct contact with the plant material.

Direct Steam Distillation

Direct steam distillation is the process of distilling plant material with steam generated outside the still in a satellite steam generator generally referred to as a boiler. As in water and steam distillation, the plant material is supported on a perforated grid above the steam inlet. A real advantage of satellite steam generation is that the amount of steam can be readily controlled. Because steam is generated in a satellite boiler, the plant material is heated no higher than 100° C and, consequently, it should not undergo thermal degradation. Steam distillation is the most widely accepted process for the production of essential oils on large scale. Throughout the flavour and fragrance supply business, it is a standard practice. An obvious drawback to steam distillation is the much higher capital expenditure needed to build such a facility. In some situations, such as the large-scale production of low-cost oils (e.g. rosemary, Chinese cedarwood, lemongrass, litseacubeba, spike lavender, eucalyptus, citronella, cornmint), the world market prices of the oils are barely high enough to justify their production by steam distillation without amortizing the capital expenditure required to build the facility over a period of 10 years or more in Figure No.9.

Advantages of Direct Steam Distillation

- Amount of steam can be readily controlled.
- No thermal decomposition of oil constituents.
- Most widely accepted process for large-scale oil production, superior to the other twoprocesses.

Disadvantage of Direct Steam Distillation

- Much higher capital expenditure needed to establish this activity than for the other two processes.

Extraction

Hydrolytic Maceration Distillation

Certain plant materials require maceration in warm water before they release their essential oils, as their volatile components are glycosidically bound. For example, leaves of wintergreen (*Gaultheria procumbens*) contain the precursor gaultherin and the enzyme primeverosidase; when the leaves are macerated in warm water, the enzyme acts on the gaultherin and liberate free methyl salicylate and primeverose. Other similar examples include brown mustard (sinigrin), bitter almonds (amygdalin) and garlic (alliin) in Figure No.10.

Expression

Expression or cold pressing, as it is also known, is only used in the production of citrus oils. The term expression refers to any physical process in which the essential oil glands in the peel are crushed or broken to release the oil. One method that was practiced many years ago, particularly in Sicily (*spugna*method), commenced with halving the citrus fruit followed by pulp removal with the aid of sharpened spoon-knife (known as a *rastrello*). The oil was removed from the peel either by pressing the peel against a hard object of baked clay (*concolina*) which was placed under a large natural sponge or by bending the peel into the sponge. The oil emulsion absorbed by the sponge was removed by squeezing it into the *concolina*or some other container.

A second method known as equalling (or the *scodella* method), uses a shallow bowl of copper (or sometimes brass) with a hollow central tube; the equalling tool is similar in shape to a shallow funnel. The bowl is equipped with brass points with blunt ends across which the whole citrus fruit is rolled by hand with some pressure until all of the oil glands have burst. The oil and aqueous cell contents are allowed to dribble down the hollow tube into a container from which the oil is separated by decantation.

Pelatrice Process

In the *Pelatrice* process, citrus fruits are fed from a hopper into the abrasive shell of the machine. The fruits are rotated against the abrasive shell by a slow-moving Archimedian screw whose surface rasps the fruit surfaces causing some of the essential oil cavities on the peel to burst and release their oil-water emulsion. This screw further transports the fruit into a hopper in which rollers covered with abrasive spikes burst the remaining oil cavities. The oil and water emulsion is washed away from the fruit by a fine spray of water. The emulsion next passes through a separator where any solids are removed, after which it passes through two centrifugal separators working in series to yield the pure oil. Most bergamot oil and some lemon oil are produced this way in Italy.

Cold Fat (Cold Enfleurage)

Enfleurage on a large scale is today carried out only in the Grasse region of France, with the possible exception of isolated instances in India where the process has remained primitive. A concentrate of the essential 'oils' is more like water, not greasy, and evaporates quickly. Aroma oils are carefully prepared by a complex process called maceration which extracts the essences from dried plant material. They are then purified using a process called defleurage and in some cases fat is used instead of oil. The final process of purification is called enfleurage. Certain flowers (e.g. tuberose and jasmine) continue the physiological activities of developing and giving off perfume even after picking. Fat possesses a high power of absorption and, when brought in contact with fragrant flowers, readily absorbs the perfume emitted. This principle, methodically applied on a large scale, constitutes enfleurage. During the entire period of harvest, which lasts for eight to ten weeks, batches of freshly picked flowers are strewn over the surface of a specially prepared fat base (corps), let there (for 24 h in the case of jasmine and longer in the case of tuberose), and then replaced by fresh flowers. At the end of the harvest, the fat, which is not renewed during the process, is saturated with flower oil. Thereafter, the oil is extracted from the fat with alcohol and then isolated. The success of enfleurage depends to a great extent upon the quality of the fat base employed. If the corps is too hard, the blossoms will not have sufficient contact with the fat, curtailing its power of absorption and resulting in a subnormal yield off lower oil. On the other, if it is too soft, it will tend to engulf the flowers and the exhausted ones will adhere; when removed, the flowers will retain adhering fat, resulting in considerable shrinkage and loss of corps. The consistency of the corps must, therefore, be such that it offers a semihard surface from which the exhausted flowers can easily be removed. The process of enfleurage is carried out in cool cellars, and every manufacturer must prepare the corps according to the prevailing temperature in the cellars during the months of the flower harvest. The fat corps thus prepared is white, smooth, absolutely of uniform consistency, free of water and practically odourless. Some manufacturers also add small quantities of orange flower or rose water when preparing the corps. This seems to be done for the sake of convention. Such additions somewhat shade the odour of the finished product by imparting a slight orange blossom or raised note in Figure No.11.

Enfleurage and Defleurage

Every enfleurage building is equipped with thousands of so called chassis, which serve as vehicles for holding the fat corps during the process.

A chassis consists of a rectangular wooden frame. The frame holds a glass plate upon both sides of which the fat corps is applied with a spatula at the beginning of the enfleurage process. When piled one above the other, the chassis form airtight

compartments, with a layer of fat on the upper and lower side of each glass plate. Every morning during the harvest the freshly picked flowers arrive, and after being cleaned of impurities, such as leaves and stalks, are strewn by hand on top of the fat layer of each glass plate. Blossoms wet from dew or rain must never be employed, as any trace of moisture will turn the corps rancid. The chassis are then piled up and left in the cellars for 24 h or longer, depending upon the type of flowers. The latter rest in direct contact with one fat layer (the lower one), which acts as a direct solvent whereas the other fat layer (beneath the glass plate of the chassis above) absorbs only the volatile perfume given off by the flowers. After 24 h, the flowers have emitted most of their oil and start to wither, developing an objectionable odour. They must then be removed from the corps, which process, despite all efforts to introduce labour-saving devices, is still done by hand. Careful removal of the flower (defleurage) is almost more important than charging the corps on the chassis with fresh flowers (enfleurage) and, therefore, the persons doing this work must be experienced and skilled. Most of the exhausted flowers will fall from the fat layer on the chassis glass plate when the chassis is struck lightly against the working table, but since it is necessary to remove every single flower and every particle of the flower, tweezers are used for this delicate operation. Immediately following defleurage, that is, every 24 h, the chassis are recharged with fresh flowers. For this purpose the chassis are turned over and the fat layer, which in the previous operation formed the top (ceiling) of the small chamber, is now directly charged with flowers. In the case of jasmine, the entire enfleurage process lasts about 70 days: daily the exhausted flowers are removed and the chassis are recharged with fresh ones. At the beginning of, and several times during, the harvest, the fat on the chassis is scratched over with metal combs and tiny furrows are drawn in order change and increase the surface of absorption. At the end of the harvest, the fat is relatively saturated with flower oil and possesses the typical fragrance. The perfumed fat must then be removed from the glass plates between the chassis. For this purpose, it is scraped off with a spatula and then carefully melted and bulked in closed containers. The final product is called pomade (pomade de jasmine, pomade de tuberous, pomade de violet, etc.). The most highly saturated pomade is pomade no. 36, because the corps on the chassis have been treated with fresh flowers 36 times during the whole process of enfleurage. At the beginning of the harvest, every chassis is charged with about 360 g fat corps on each side of the glass plate, in other words, with 720 g per chassis. Every kilogram of fat corps should be in contact with about 2.5 kg (preferably with 3.0 kg) of jasmine flowers for the entire period of enfleurage, which lasts from 8 to 10 weeks. The quantities differ somewhat for different flowers. At the end of enfleurage, the fat corps has lost about 10% of its weight because of the various manipulations in Figure No.12.

Hot Maceration Process

In this process, the long enfleurage time is reduced by the immersion of petals in molten fat heated at 45°-60° C for 1 to 2 h, depending upon the plant species. After each immersion, the fat is filtered and separated from the petals. After 10 to 20 immersions, the fat is separated from waste flowers and water. Absolute of maceration is then produced from fat containing oil through the process of extraction and concentration under reduced pressure. It is mainly used for highly delicate flowers whose physiological activities are lost rapidly after their harvest, such as lily.

Traditional methods of extraction of essential oils have been discussed and these are the methods most widely used on commercial scale. However, with technological advancement, new techniques have been developed which may not necessarily be widely used for commercial production of essential oils but are considered valuable in certain situations, such as the production of costly essential oils in a natural state without any alteration of their thermo sensitive components or the extraction of essential oils for micro-analysis. These techniques are as follows:

Fragrances can have a relaxing effect measured as an increase in alpha brain waves. One of the best known essential oils for aromatherapy is lavender, which is

recommended by practitioners for treating wounds, to enhance memory, and to aid sleep by combating anxiety and insomnia. Other popular scents include eucalyptus, rose, jasmine and bergamot. Aromatherapy is among the fastest growing fields in alternative and holistic medicine in Table No.1. Aromatherapy is sometimes used in clinics and hospitals for treatment of pain relief, for labor pain, for relieving pain caused by the side effects of the chemotherapy, and for the rehabilitation of cardiac patients [14].

Table No.1: Therapeutic uses of Essential oil

Essential Oil	Therapeutic Uses
Absinthe	Use in Indigestion, gastric pain, and lack of appetite,
Angelica	Used for respiratory problems and as a tonic for digestive systems.
Anise	Used as Antiseptic, antispasmodic, carminative, diuretic, expectorant, galactogogue, stimulant, stomachic. Used to relieve dyspepsia, colic and flatulence
Basil	Used as Antispasmodic, Analgesic, antidepressant, antiseptic, antispasmodic, carminative, cephalic, diaphoretic, digestive, emmenagogue, expectorant, febrifuge, nervine, sudorific, immune stimulant.
Bergamot, Cempaka , Celery, Galbanum	Anti-depressant
Birch Bud	Used as Diuretic, Blood-Cleanser and skin treatment, dermatitis boils and ulcers
Black Pepper	Used as Analgesic, Digestive Stimulant
Cardamon	digestive aid, used as aphrodisiac
Carrot Seed	Used as Carminative, Cytophylactic, Depurative, Diuretic, Emmenagogue, Hepatic, Stimulant, Anathematic, Antiseptic, Tonic, Vasodilatory, Smooth Muscle Relaxant, Blood Purifier .
Cassia	Used as Stomachic, Carminative, Mildly Astringent
Cederwood, Virginian	Used in acne, Arthritis, Bronchitis, Coughs, Cystitis, Dandruff, Dermatitis, Insect Repellent, Vaginal Infections, Stress.
Celery Seed	Used in Amenorrhea, Arthritis, Dyspepsia, Flatulence, Gout, Indigestion, Jaundice, Liver Congestion, Rheumatism.
Chamomile German	Used in Abscesses, Allergies, Arthritis, Boils, Colic, Cuts, Cystitis, Dermatitis, Dysmenorrhoea, Earache, Flatulence, Hair, Headache, Inflamed Skin, Insect Bites, Insomnia, Nausea, Neuralgia, Pms, Rheumatism, Sores, Sprains, Strains, Stress, Wounds.
Coriander	Used as Anti-inflammatory and Sedative properties.
Fenugreek	Used as Carminative, Demulcent, Expectorant, Laxative, and Stomachic. The plant has also been employed against Bronchitis, Fevers, Sore throats, Wounds Swollen glands, Skin irritations, Diabetes, Ulcers, and in the treatment of Cancer.
Eucalyptus	Used as Antiviral, Antibacterial, Used in rheumatism, muscular aches and fibrosis.
Ginger	Used in Aching muscles, Arthritis, Nausea, Poor circulation, Colds and flu
Lavender	Good for relaxation, Acne, Allergies, Anxiety, Asthma, Athlete's Foot, Bruises, Burns, Chicken Pox, Colic, Cuts, Cystitis, Depression, Dermatitis, Earache, Flatulence, Headache, Hypertension, Insect Bites, Insect Repellent, Itching, Labour Pains, Migraine, Oily Skin, Rheumatism, Scabies, Scars, Sores, Sprains, Strains, Stress, Stretch Marks, Whooping Cough.

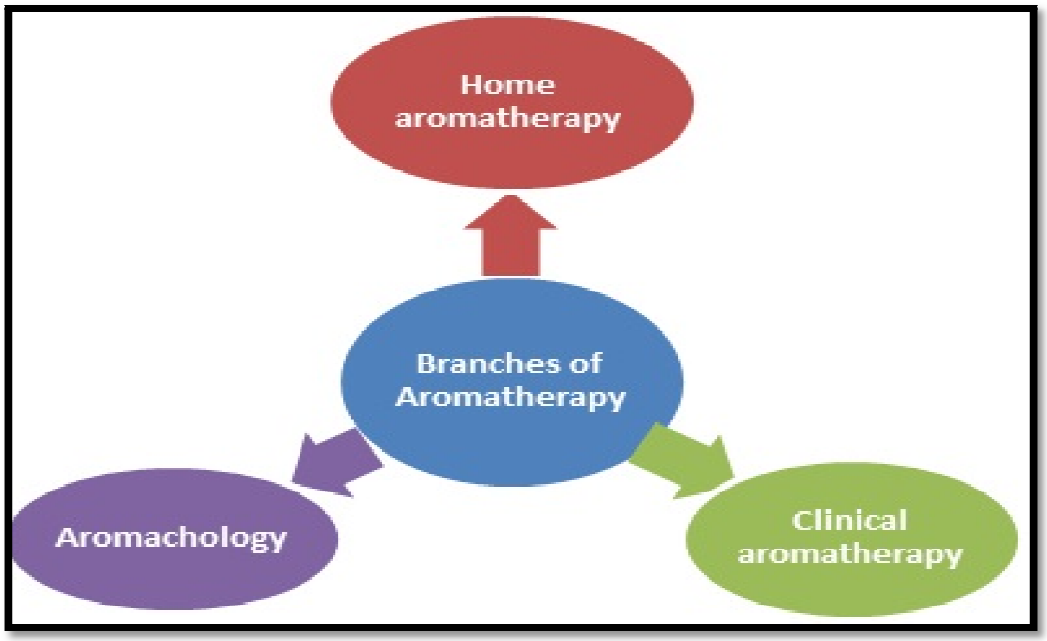

Figure No.1: Different Branches of Aromatherapy

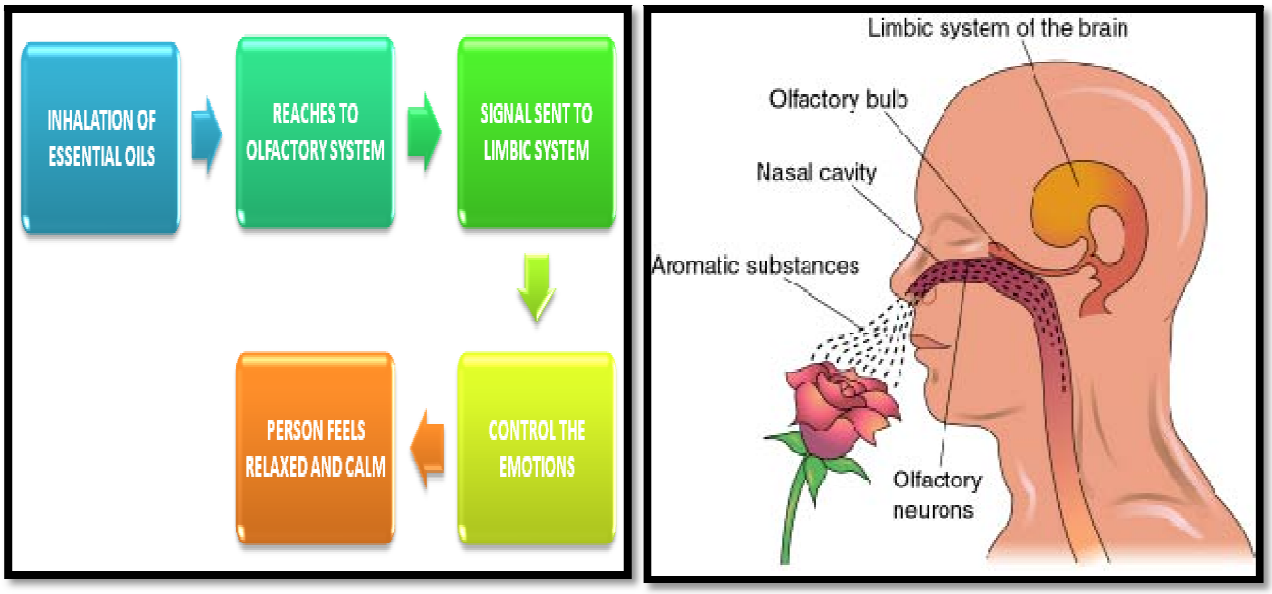

Figure No.2: Theory behind Aromatherapy

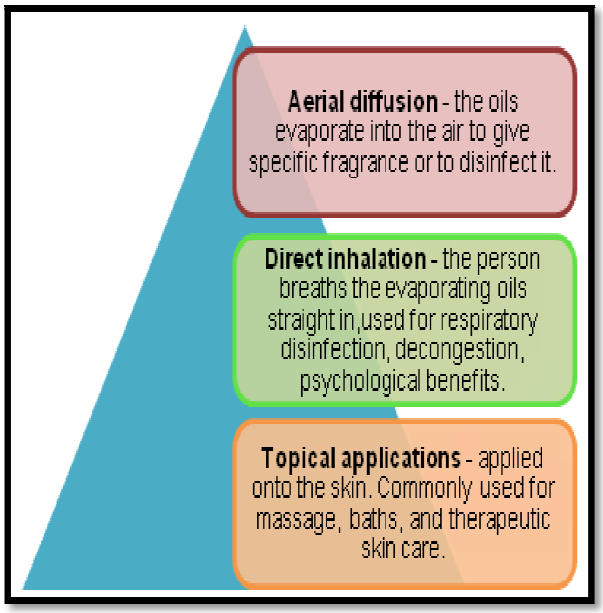

Figure No.3: Application of Aromatherapy

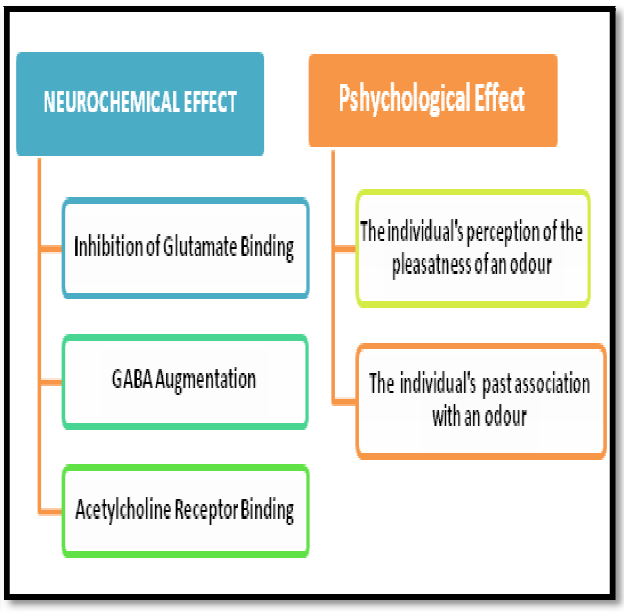

Figure No.4: How does aromatherapy work

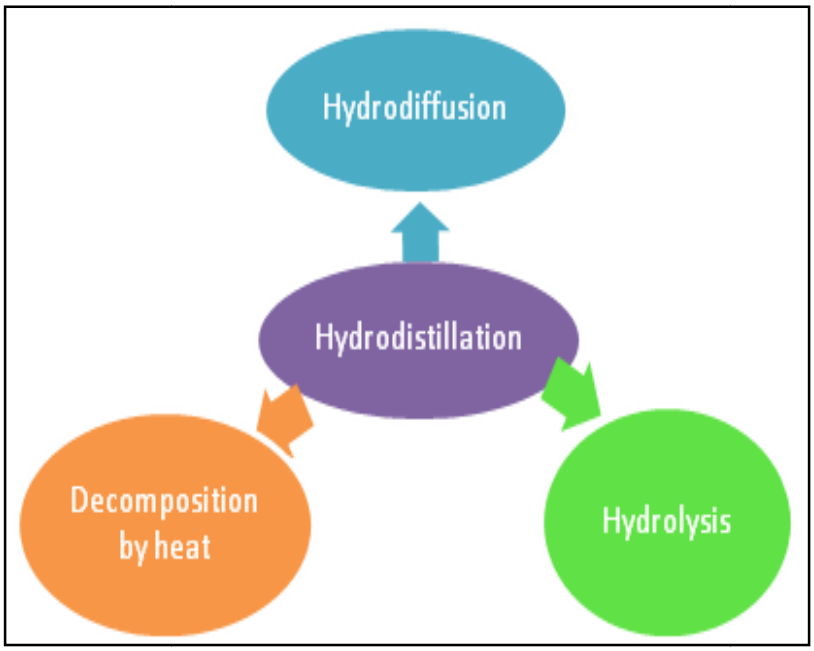

Figure No.5: Hydro distillation Physiochemical processes

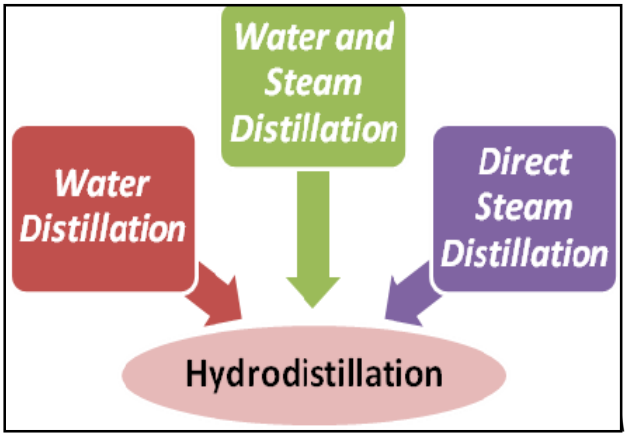

Figure No.6: Types of Hydro distillation

Figure No.6: Hydro distillation Unit

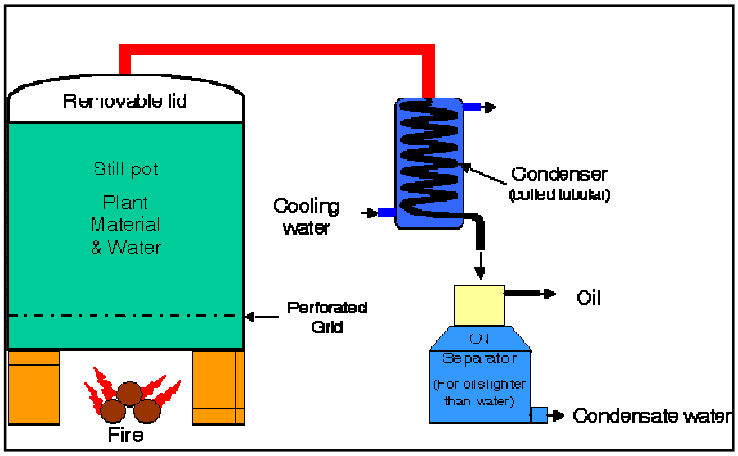

Figure No.7: Water Distillation Unit

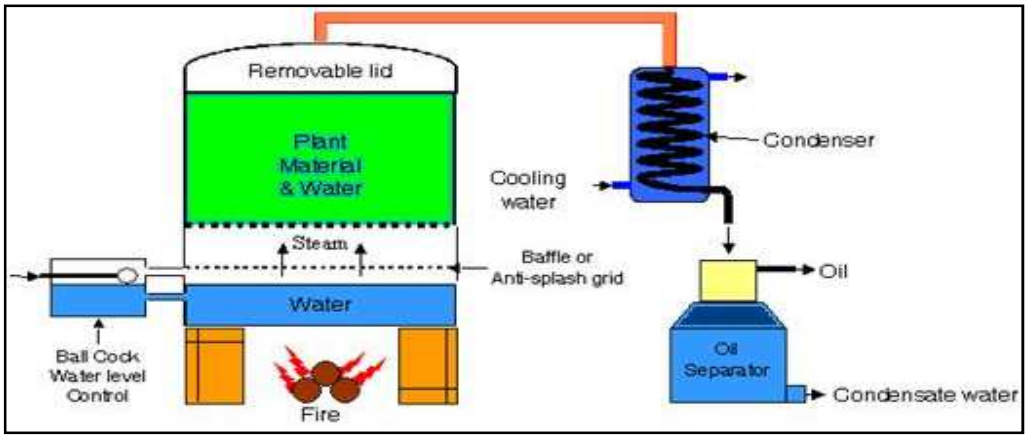

Figure No.8: Water and Steam Distillation Unit

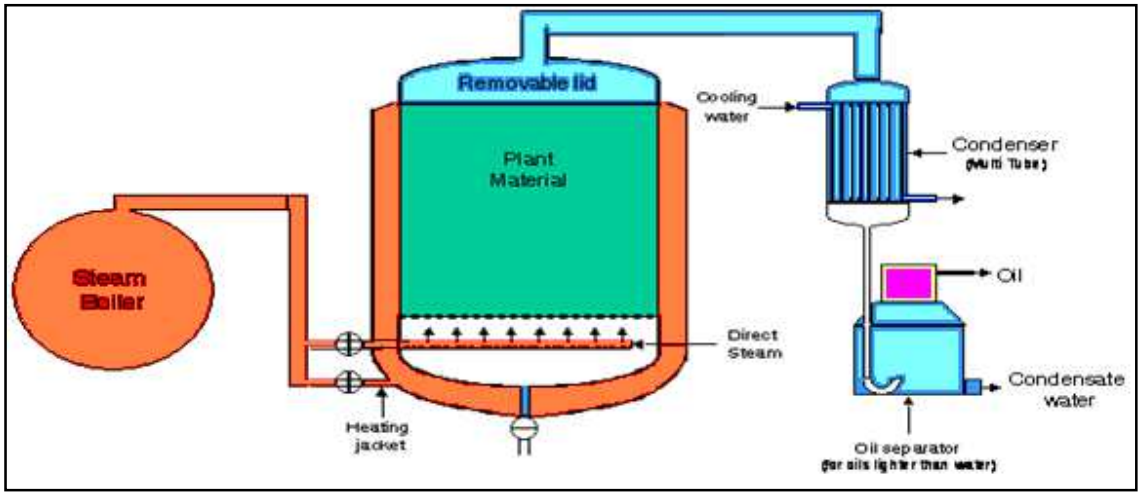

Figure No.9: Steam Distillation Unit

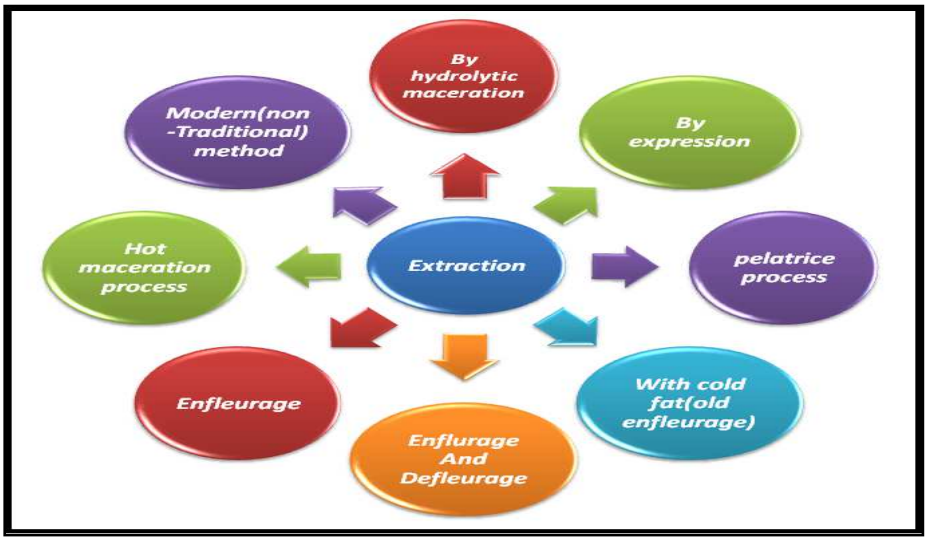

Figure No.10: Types of Extraction

Figure No.11: Enfleurage and Defleurage

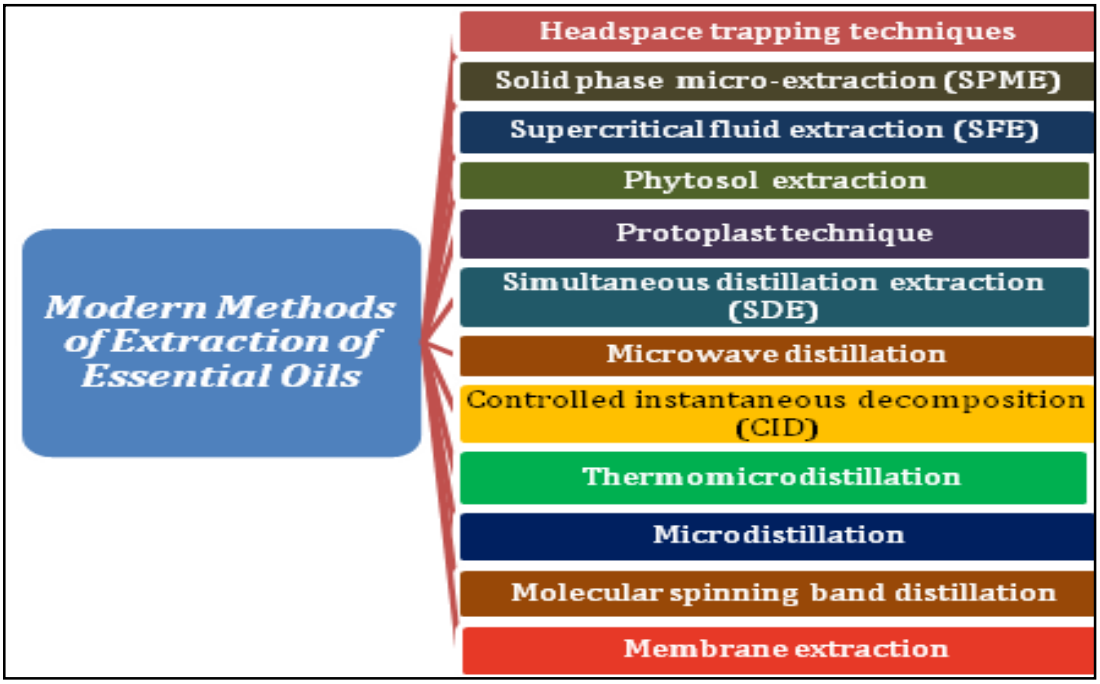

Figure No.11: Modern (Non-traditional) Methods of Extraction of Essential Oils

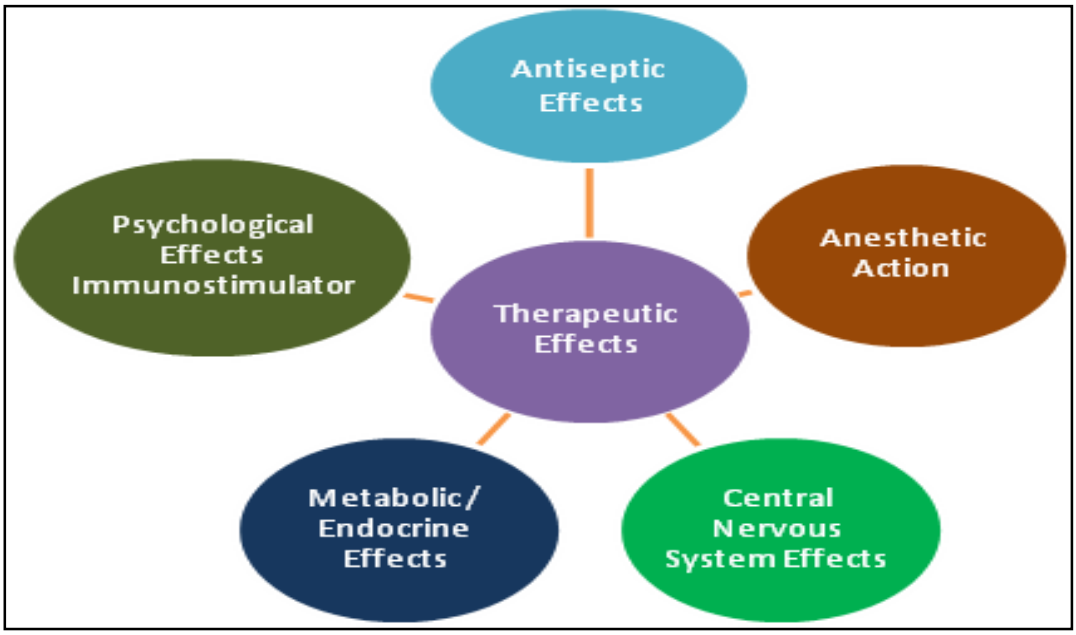

Figure No.12: Therapeutic effects

CONCLUSION

It is important to follow the product instructions carefully. Concentrated products may be poisonous before dilution and should be handled with care. If you have any of the following conditions you should be extra careful/cautious about aromatherapy:

- If you have an allergy, or allergies
- If you suffer from hay fever (a type of allergy)
- If you suffer from asthma
- If you have skin conditions, such as eczema or psoriasis *Be extremely cautious if*
- You suffer from epilepsy
- You suffer from hypertension (high blood pressure)
- Have DVT (deep vein thrombosis)
- You are breastfeeding
- Your are pregnant

Aromatherapy does sometimes have side effects. However, they tend to be very mild and do not last long. These include nausea, headaches and some allergic reactions. Skin sensitivity to sunlight - essential oils derived from citrus may make the skin more sensitive to ultraviolet light, making the person more susceptible to sunburn. Some oils may change the effectiveness of conventional medicines - if you are not sure, check with a qualified pharmacist or doctor [15, 16].

ACKNOWLEDGEMENT

The authors are sincerely thanks to the Padmashree Dr. D.Y. Patil College of Pharmacy, Akurdi, Pune - 411044, India for providing the facilities to complete this review work.

REFERENCES

1. Gattefosse M, Gattefosse's Aromatherapy Aromatherapie'les Huiles Essential Hormones Vegetables, 1993.
2. Ryan N. Harrison .Aromatherapy & Essential Oils, 2013, www.bewholebewell.com.
3. Christian Nordqvist. What Is Aromatherapy? The Theory behind Aromatherapy, 2009, 10884.
4. Manniche, Lise. Sacred Luxuries: Fragrance, Aromatherapy & Cosmetics in Ancient Egypt. *Ithaca, NY: Conell University Press*, 1999.
5. Jane Buckle. Clinical Aromatherapy Essential oils in practice. *United State Of America, Churchill Livinstone*, 2, 2003, 13.
6. Price, Shirley. Shirley Price's Aromatherapy Workbook. *London, UK, Thorson*, 1993.
7. Cindy Murdoch. Aromatherapy. Brief List of Scents to Manipulate Basic, 2013.
8. Ernst E, Pittler MH, Wider B, editors. The desktop guide to complementary and alternative medicine. An evidence-based approach, Elsevier, 2, 2006.
9. Rho KH, Han SH, Kim KS and Lee MS. Effects of aromatherapy massage on anxiety and self-esteem in Korean elderly women: a pilot study. *Int J Neurosci*, 116 (12), 2006, 1447– 1455.
10. Buchbauer G & L Jirovetz. Aromatherapy Use of fragrances and essential oils as medicaments. *Flavour and Fragrance Journal*, 9, 1994, 217-222.
11. Ballard CG, O'Brien JT, Reichelt K, Perry EK. Aromatherapy as a safe and effective treatment for the management of agitation in severe dementia, *J Clin Psychiatry*, 63(7), 2002, 553-538.
12. Garg SC. Essential oil as Therapeutics. Natural Product Radiance, 2005, 18-26
13. Hüsnü K Can Bas¸er Gerhard Buchbauer. Handbook of essential oils Science, Technology, and Applications. *New York, CRC Press Taylor & Francis Group* 2010.
14. Vankar PS. Essential oils and fragrances from Natural sources.Resonance, 2004, 30-41.
15. Dunn C, Sleep J, Collett D. Sensing an improvement:an experimental study to evaluate the use of aromatherapy,massage and periods of rest in an intensive care unit. *J AdvNurs*, 21, 1995, 34–40.
16. Jane Buckle. Clinical Aromatherapy Essential oils in practice. *United State Of America, Churchill Livinstone*, 2, 2003, 60-63.