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Biological Importance of Essential Oils

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Abstract

Essential oils are the volatile compounds having the oily fragrance. Essential oils are obtained from the different plant parts, and they are extracted from the different techniques and the most preferable method of extraction is the hydrodistillation which is cheap and easy to use. Plant parts including the flowers, leaves, stem, bark and roots are used for the isolation of essential oils. Essential oils are used in almost every field of life and because of these characteristics, the market of essential oils is growing rapidly. Essential oils are used in the aromatherapy and act as antioxidant, antimicrobial, antifungal, pain relievers, anxiety, depression. In the field of cosmetics and industries, the essential oils are used rapidly and mostly used in the perfume industries which are growing increasingly. Essential oils are used in the food preservations and many food items. Essential oils are used as the folk herbal medicines and their fragrance is used for the improvement of the mood and as the depression release.

Keywords: acts as the antioxidant, antimicrobial, antifungal, pain reliever, anxiety and depression

1. Introduction

Essential oils have been used in the folk medicines throughout the history. Essential oils are called the ethereal or volatile oils, which are fragrant oily liquid that are extracted from the various parts of the plants and mostly used as the food flavors. An essential oil is “essential” in sense that it contains the essence of the different fragrance, and the properties of the plants from which they are derived. These volatile oils showed the different kinds of biological activities including the antibacterial, antioxidant, antiviral, insecticidal, etc. [1]. These oils are also used for cancer treatment, while some other has been used for the food preservations, aromatherapy, and in the perfumery industries [2]. The antimicrobial and antioxidant screening of essential oil acts as the root of numerous applications including the processed and fresh food preservations, natural therapies, pharmaceuticals, and alternative medicines [3]. Essential oils are used in aromatherapy as an alternative source of wound healing because of the aromatic compounds that are present in the essential oils. It is also used as a relaxation process, but this evidence is not under consideration [4].

Numerous efforts are made to explore the essential oils usage as the treatment of various infectious diseases that supernumerary to the pharmaceutical’s remedies. Medicinal and aromatic plants are extensively used as natural organic compounds

and as medicines [5]. Previously, essential oils have been used for the treatment of various sorts of infectious diseases in the whole world. Now, in this era, the importance of essential oils is increasing day by day, because they are mostly used in the beverage and food industries, cosmetics and fragrance industries for making valuable perfumes, and with lot of biological activities [6].

Various essential oils have been used for the insecticidal activities against the different pests, but in detail, studies showed that they do not show the repellence, avicidal, phytochemistry, antifungal, and oviposition. The essential oils do not show the abovementioned characteristics, but there is still urgent need to work on this side of research and study the in vivo and in vitro studies to control the pests, and most of the oils have shown good antioxidant activities [7]. Essential oils that showed good antioxidant activates and acts as the defensive role for the unsaturation of lipids in the tissue of the animal and they also act as hepatoprotective negotiators in mammals. The antioxidant substances are most important for human being because of the oxygen which is a toxic element and has the ability to change the metabolic activities into the most reactive form of oxygen just like the super oxide, hydrogen peroxide, hydroxyl free radicals, and the singlet oxygen which are collectively called as active oxygen [8]. Essential oils are best known for their action as the antispasmodic, antiviral negotiators, antimicrobial, and carminative, and the essential oil composition is variable; they also show different sorts of activities and mostly depend upon the chemo types [9].

2. Sources and isolation of essential oils

Essential oils were extracted from different aromatic plants. These plants are distributed in the tropical countries and Mediterranean. These plants got importance because local people use them for the treatment of diseases. The essential oil is produced in every part of the plant including the leaves, seeds, buds, stem, flowers, leaves etc as shown in **Figure 1**. Essential oil is accumulated from the epidermic cell, cavities, secretary cells, and channels [10]. The odor that is produced in plants is because of essential oils. The essential oils were extracted from the dried, fresh, or partially dehydrated materials of plant. The extraction rate depends upon the diffusion via plant tissues that directly involve the surface from which the essential oil was removed by different processes. The extraction of essential oil depends upon the stability of the essential oil. The two most important method that are used for the extraction of essential oil was used are steam distillation method and the hydro distillation process as shown in **Figure 2**. These are the most suitable and effective techniques for the extraction processes [11]. Some other methods were also used for extraction but they are not too much suitable for this process these are the microwave or liquid carbon dioxide, high- or low-pressure distillation with the help hot water or steam water (**Figures 1 and 2**) [12].

The essential oil extracted from the steam distillation method is mostly used in pharmacological activities and food items, while the essential oil that are used in the fragrance industry or perfume industry are extracted from the lipophilic solvents and sometime with the supercritical carbon dioxide going more attractive [13]. The quality of the essential oil depended on the basis of the age of plants, parts that are used for extraction, vegetative cycle stage, effect of climate, etc. The chromatographic and the spectroscopic techniques fully changed the chemical analysis of the essential oils. The chemical composition of the essential oils was studied with the help of IR-spectroscopy, UV-Vis spectroscopy, gas chromatography, NMR

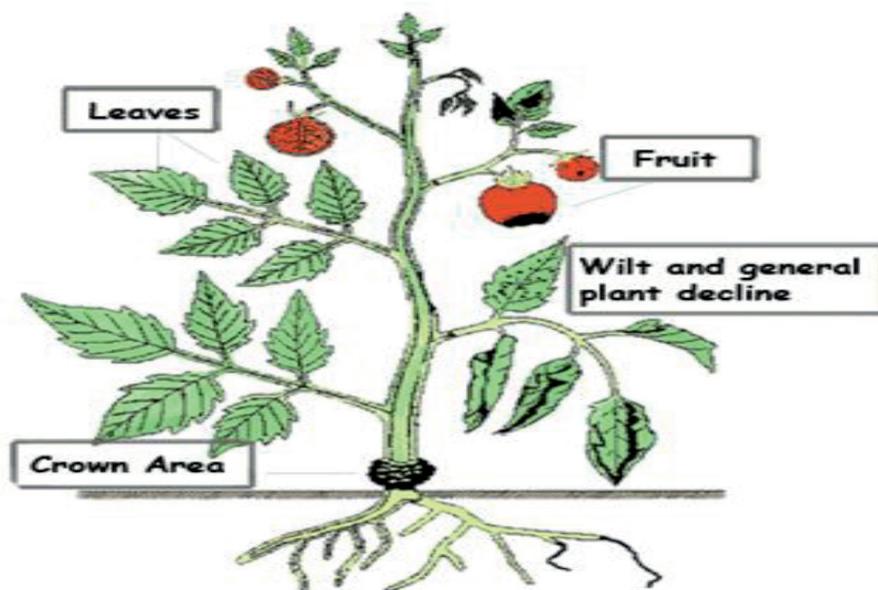


Figure 1.
Plants and their parts used for the isolation of essential oils.

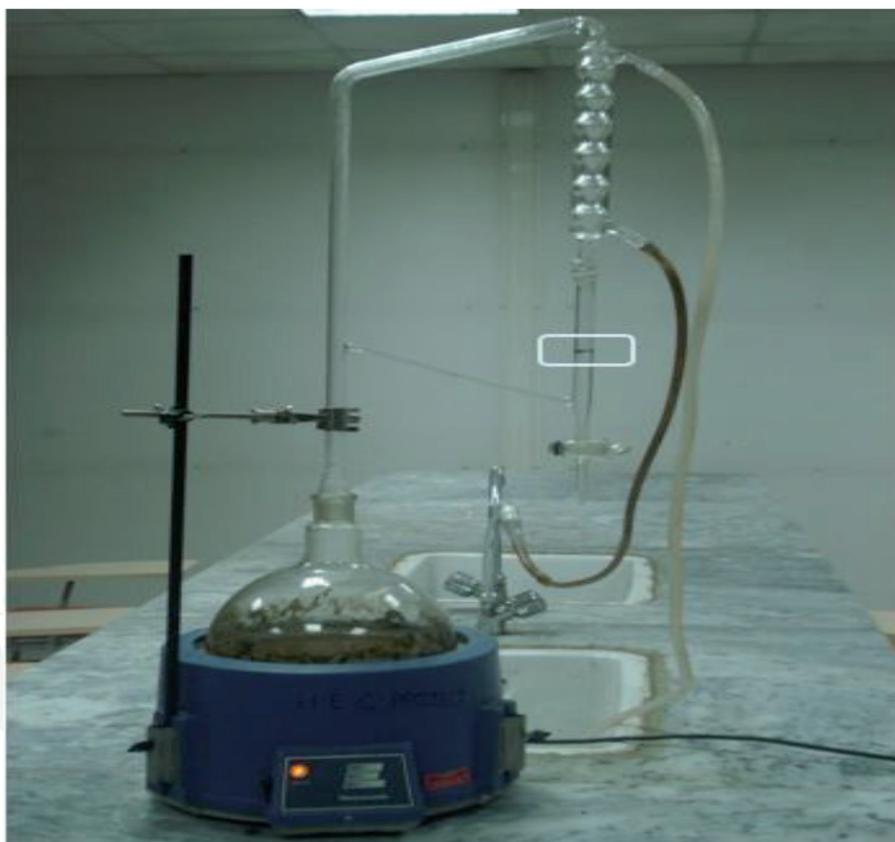


Figure 2.
Hydrodistillation apparatus used for the extraction of essential oils.

spectroscopy [14]. The enhanced demand for the essential oil in various fields of life provoked us to access the reliable methods for the essential oil analysis, and the techniques used are the GC-MS and GC analyses [15]. The characterization of the essential oil was carried out by using the gas chromatography. The compounds that are present in the essential oil was confirmed by using the GC and GC-MS analysis [16]. The storage and handling of the essential oil also affect its yield and quality, and essential oil was deposited in the oil glands that are present in the organization of the plant material [16].

3. Essential oil industry

The worldwide essential oil market demand was 226.8 kilotons in year 2018. It is expected to expand at a CAGR of 8.6% from the 2019 to 2025. Usage of essential oils in industries are increases day by day including the beverage, food, personal care, aromatherapy, and cosmetics. Various sorts of the health-related benefits are offered by essential oils and they are reported as the anticipated fuel and their demand is increasing in the medical and pharmaceuticals applications. Most of the conventional drugs have no side effects. The growing inclination of the consumers toward the organic and natural products is leading to increase the use of essential oils in the beverage, food, and cosmetics industries. Worldwide essential oil market will cross USD 13 billion in the year of 2024 the latest report of the Global Market Insights, Inc. The increase in the World population are suffering from the different kinds of health-related issues and essential oils are used in aromatherapy products and due to this reason, the Worldwide market of essential oils are increasing day by day [17].

The period when essential oils were utilized first on a commercial scale is hard to recognize. The nineteenth century is for the most part viewed as the beginning of the cutting-edge period of commercial utilization of essential oils. Notwithstanding, the extensive scale use of essential oils goes back to antiquated Egypt. In 1480 BC, Queen Hatshepsut of Egypt sent a campaign to the nation of Punt (presently Somalia) to gather fragrant plants, tars, and oils, as elements for medicaments, scents, and flavors and for the preservation of bodies. Valuable scents have been found in numerous Egyptian archeological unearthing, as an image of riches and social position. The huge global exchange of fundamental oil-based items is the standard for modern use; “Ruler of Hungary Water” was the primary alcoholic scent ever. This aroma, in view of rosemary basic oil distillate, was made in the mid-fourteenth century for the Polish-conceived Queen Elisabeth of Hungary. Following an uncommon introduction to King Charles V, The Wise of France in 1350, it ended up prevalent in all medieval European courts. The start of the eighteenth century saw the presentation of “Eau de Cologne,” in light of bergamot and different citrus oils, which remains broadly used right up ‘til the present time. This crisp citrus aroma was the making of Jean Maria Farina, a relative of Italian perfumers who came to France with Catherine de Medici and settled in Grasse in the sixteenth century. As indicated by the city of Cologne files, Jean Maria Farina and Karl Hieronymus Farina, in 1749, built up a processing plant (Fabriek) of this water, which sounds exceptionally “mechanical.” The “Kolnisch Wasser” turned into the main unisex aroma as opposed to one basically for men, known and utilized all over Europe, and it has been rehashed in this manner in incalculable counter-types as a scent for men. The essential oil market was extended day by day because of increase in demand for the essential oil products including the soap, cosmetics, and food industries. The international companies are the major contributors of the development of the essential oil industries in the mid-nineteenth century [18].

Changing the standards of the living led to the occurrence of different sorts of mental issues including the depression, anxiety, insomnia, and stress that led to grow the market of essential oils because they are used for the treatment of such kinds of diseases. There are more than 300 industries in the Pakistan which industrialized various human resources. These industries used unprocessed material especially essential oils that are imported from the western countries. Pakistan imports more than Rs. 1526.8 million to buy essential oils and perfumes and isolates [19]. Pakistan is an agricultural country that is rich in aromatic sorts of plants, which are used as natural medicines and are used in local areas to cure common diseases. The environment of Pakistan is much more suitable for the growth of essential oils crops. And from

these plants the essential oils obtained, and they are used in essential oil industries, but this industry is not much more attractive in Pakistan.

4. Modern trends of essential oils

The essential oil has been large number of usages in worldwide products including the ice creams perfumes, backed food stuff, beverage, and cosmetics as shown in **Figure 3**. Newly, at least 300 kinds of essential oils out of 3000 are commercially important in various kinds of industries including the perfume and sanitary industries, cosmetics, food, beverage, agronomics, and pharmaceuticals [20]. Some of the bioactive components that are present in essential oils are the limonene, geranyl acetate, carvone, etc., and these are the important components of the hygienic products and tooth pastes. Essential oils are used for the preservation of the food additives; for the treatment of common diseases and folk medicines; and used by aromatherapist. Essential oils are used as the natural antioxidant. The usage of natural antioxidant is prominent in the defensive medicines and food items, and because of this reason, essential oils are getting popular day by day. Recently, the growth explores the applications of the volatile essential oils for remedial usage and in the treatment of some infectious diseases [21].

Essential oils are widely used in perfumes, personal hygiene products, and in aromatherapy including the inhalation, massage, masking agent to avoid the unpleasant odor in the textile industries, paint and plastic industries, and pharmaceuticals formulations. Essential oils are also used as the natural antifungal and antibacterial agents in the food safety items; essential oil also used in the various kinds of cereals, antimicrobial packing of the food items, edible thin film, nano-emulsion, preservation of the fruits and vegetables, soft drinks, as the flavoring agents in the carbonated drinks, as the major ingredients in soda/citrus concentrates, seafood preservations, fish, etc. (**Figure 3**) [22].



Figure 3.
Modern trends of essential oils.

5. Growing trends of essential oils adaptation

The essential oils are the products that are obtained from the plant extracts and have been used for large-scale industrial and homemade products. The major usages of essential oils are pest control products, cleaning actions, and counter

medications among the other products and personal care products. Essential oils have various advantages in wound healing, rejuvenation, and relaxation. Alongside their applications in the betterment of the health issues, the most common health issues such as migraines and nausea are cured from the essential oils. It is also used in the food industries because of their preservative potential in contrast to the foodborne pathogens, antibacterial, antimicrobial, and antifungal characteristics. The use of aromatherapy as the harmonizing care is speedup due to their unique characteristics which include the coping with some of side effects of cancer and to promote the wound healing [23].

6. Uses of essential oils in perfumery

The essential oils that are used in the perfume industries are classified according to their diffusion rate in air and volatility:

Base note: these are the least volatile essential oils and last for a longtime period. These remain for longtime duration including several hours. Some essential oils that are used as the base notes are the Myrrh, vanilla, sandalwood, and frankincense.

Middle note: these sorts of essential oils are tending to be spicy or floral and give body to blends; their time duration is less and remain up-to 1 hour. These include Ylang-ylang, jasmine, geranium, clove, and lavender.

Top note: these are the most volatile and the first perceptible odors from the perfume. Their time duration is too much less and remains maximum for 30 minutes. These include berry, bergamot, cinnamon, juniper, and gardenia.

Perfumes are formulated mostly using alcohol, though these may contain the cloudy solutions. Eau de types of perfumes are mostly formulated using the essential oils generally amber color because of their natural oils color but normally they are clear.

6.1 Percentage of essential oils in different perfumes products

- Eau de perfume usually contains 8–15% amount of essential oils or sometimes their fragrance, and 80–90% alcohol.
- Splash cologens usually contain 1–3% fragrance or essential oil, and 80% alcohol.
- Eau de cologne usually contains 3–5% of fragrance or essential oil, and up to 70% alcohol.
- Eau de toilette usually contains the essential oil between 4 and 8% or its fragrance, and 80–90% alcohol [24].

6.2 Increasing the sales of essential oils to the home appliances

All over the world, people are shifting toward the herbal products for the treatment of skin diseases compared to medicines and synthetic drugs. The essential oil is pure and does not have any side effects. The demand for essential oil is increasing because of their usage in daily life and it is mostly used for the relaxation purpose and people prefer it because of its no side effects. Aura Cacia that is manufacturer of Iowa-based care products said that the essential oil sale was increased 90% between the 2009 and 2012, and the sale of household items that contains the essential oil was increased from 6 to 12%.

Essential oils play a key role in treating the dermatological issues including the rashes, acne, hives, eczema, and psoriasis which made the essential oil suitable for the skin treatment care products that enhance the growth of skin industry. The market of essential oils is growing because it has no side effects, and other synthetic chemicals have side effects, so they are less preferred. Essential oils market of home care products and cleaning products will be increased to 550 million USD by 2024. The growth in essential oil market along with the companies that are introducing the products with supplementary benefits such as better cleaning, easy fragrance, and germ fighting.

The essential oils market of France will be increased up to 8.5% by 2024. Major cosmetics industries used essential oils in cosmetics and imported these oil products worldwide. Companies used the marketing strategies to spread the awareness to the people regarding the usage and benefits of essential oils, and the aromatherapy markets gets more enhanced customers to buy these products. The essential oil market of India will be exceeding up to 790 million USD by 2024. Since being a large country, India used the large-scale agricultural techniques to grow crops of essential oil plants including lemon, mint, and spices, and its aromatherapy market are growing day by day.

Lavender oil market will be reached up to 20 kilotons by 2024. It is used in fighting the serious health conditions, including the chronic anxiety, relieves pain, cancer, stress with reverse sign of the ageing, headache, cosmetics applications, pharmaceuticals applications, aromatherapy etc. as shown in (Figure 4). The major companies that share large market size of essential oil-based products are Firmenich, Frutarom, Flaex, Rock Mountain Moksha Lifestyle, and Florihana Falcon Young living (Figure 4) [25].

6.3 Some major essential oils and their applications

6.3.1 Bergamot

The essential oil of bergamot obtained from the peel of the fruits of the *Citrus bergamia* is known as the bitter orange tree. The extract of the bergamot is used in flavoring

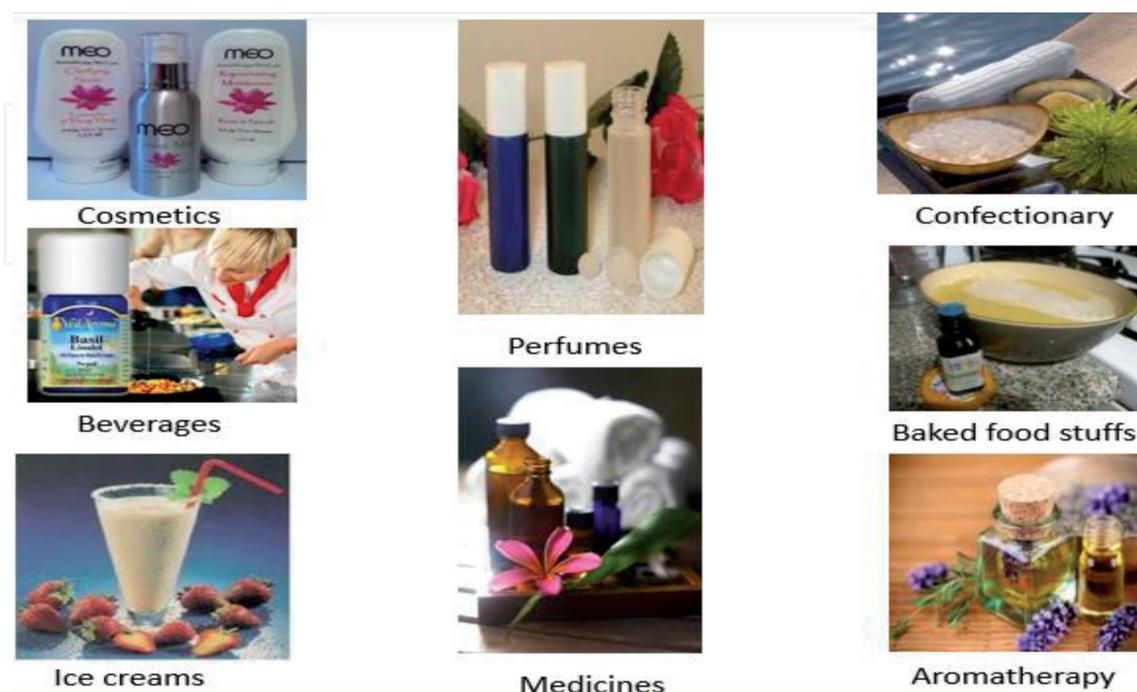


Figure 4.
Applications of essential oils in daily life.

in Earl Grey tea and essential oil of this is used also for the same purpose. It is applicable for the treatment of skin diseases, and it improves the mood, relieves pain, reduces fever, treats the digestive system problems, and breaks up chest congestion [26].

6.3.2 Clove

It is extracted from the aromatic flower buds of *Syzygium aromaticum* tree that is native to Maluku, Indonesia. The essential oil of Clove provides the strong fragrance, used in cooking spice foods; medically, it is used as pain relief, used for the treatment of dental disorders, for nausea treatment, to reduce inflammation, for the treatment of the digestive ailment, and to clear up acne [26].

6.3.3 Eucalyptus

It is extracted from the different species of genus *Eucalyptus*. Every type of species contains different and unique usage in every field. The most familiar essential oil obtained from the *Eucalyptus globulus* has a mint-like fragrance. It is used for decongestant chest rub, as pain relievers, as an antimicrobial agent, immunostimulant, and for the treatment of the flu and cold cough. It is used in aromatherapy and it provides mental clarity; it also boosts up energy and used as a natural insect repellent [26].

6.3.4 Frankincense

The earliest known and the most useful essential oil is Frankincense and it is obtained from the resin of the four species of the generous *Bowwellia* and the most known from this genus is the *Bowwellia carterii* hard tree which grow in the arid land of Arabian Peninsula and north eastern. The old African people used the essential oil of Frankincense in the religious and spiritual ceremonies. The Frankincense essential oil is unique from all other obtained essential oils because of the perfect combination of wood, balsam, earth, and citrus. It is used as the mood enhancer, antimicrobial, stress reducer, for faster wound healing, aid in digestion, anti-inflammatory, fades scars, reduces swelling of insect bites, for the treatment of skin diseases, and eases itching [26].

6.3.5 Lavender

The most effective essential oil obtained from the *Lavandula angustifolia* is the most popular garden herb English lavender. Its odor is same as the flowers from which they are obtained having the sweet smell, floral, and green, and the health benefits are greater as compared to their fragrance. The best purpose of essential oil of lavender is their sleep-inducing properties and calmness. It showed good antioxidant, anti-inflammatory, antibacterial, and antifungal properties, and it is also used for the treatment of various sorts of skin diseases including eczema or ringworm and acne. Lavender essential oil is used to enhance the digestive system, to reduce the swelling of sore muscles, and to relieve pain. Due to its attractive smell, it attracts butterflies, bees, and some pollinators, and it also acts as a natural repellent for many flying six-legged pests [26].

6.3.6 Lemon

Essential oils obtained from the lemon are mostly used. The essential oil obtained from the *Citrus limon* is used worldwide. The essential oil of lemon is used as antimicrobial agents, in household items including soaps, polishes, furniture, fresheners, and

in most of the cleaning products. Some other uses of these essential oils are that they are the pain relievers, show antifungal activity, help for the loss of weight, and alleviate the severe nausea; the essential oil of lemon is used in aromatherapy to reduce the anxiety and stress and simultaneously enhances the concentration and mood. It is also used for cleaning the hair and enhancing the natural growth of hairs [26].

6.3.7 Oregano

The essential oil of Oregano was obtained from the kitchen spice *Origanum vulgare*. It is the perfect combination of the earth, spice, and warmth. When the bottle of essential oil is opened, their fragrance has an effect on the senses. The usage of the essential oil of Oregano is increasing day by day and it is mostly used for the skin care treatment like eczema, rosacea, and psoriasis. It is used to alleviate the menstrual problems or painful menstrual cramp, used to cure stomach problems, and helps to control the flu and cold infections [26].

6.3.8 Peppermint

The essential oil of peppermint is used worldwide and it is obtained from the *Mentha piperita*. This mint hybrid is the most favorite between the essential oil and gardeners. It is the most famous type of essential oil because of its unique applications, and it is mostly used in preventing flu and cold, alleviating headache, relieving pain in muscles and joints, clearing the skin conditions, relieving nausea, and improving the digestive system processes [26].

6.3.9 Rosemary

The essential oil of rosemary is obtained from the evergreen shrub of *Rosmarinus officinalis* and is famous albeit common kitchen herb has the extraordinary healing potential in its natural oil. Just like the rosemary, the essential oil of this herb has the crisp woody, herbal, and somewhat balsamic odor just like the camphor. Due to its unique fragrance of rosemary oil, it is used for cleaning the inside and outside of the body. It is further used for the treatment of various diseases, especially skin care, dandruff treatment, to improve the scalp health, to boost up the immune system, flu infections, and ward off cold. Although this oil is used to alleviate the pain, swelling in joints and muscles, for treatment of the digestive tissues, soothe tension headaches, to promote the mental clarity, to enhance the memory, and improve mood, it is also the best natural insecticide and the bug repellent [26].

6.3.10 Tea tree

The essential oil of the tea tree is obtained from the leaves and stem of *Melaleuca alternifolia* and shrub of *Camellia sinensis*. The oil is toxic if ingested directly and it is used mostly for the external purposes and has the herbal, fresh, and slightly camphorates aroma. *Melaleuca* claims that essential oil of tea tree act as an antimicrobial agent, treating antifungal infections, and cleansing wounds. It is used in cosmetics products including the shampoo to clear some scalp conditions and dandruff and used for the treatment of insect bite to reduce itching and inflammation [26].

6.3.11 Some plant species essential oils and their usage

Some plant species essential oils and their usage are shown in **Table 1**.

S. no.	Plant species	Essential oil	Uses
1	<i>Pimenta racemosa</i>	Bay oil	Aches, muscle circulation, improve dandruff [27]
2	<i>Callitris intratropica</i>	Blue cypress oil	Asthma [27]
3	<i>Daucus carota</i>	Carrot seed oil	Detoxification, eczema [27]
4	<i>Apium graveolens</i>	Celery seed oil	Treat of gout, antifungal diuretic, blood pressure, antiseptic reduces sedative, urinary antirheumatic [27]
5	<i>Stellaria species</i>	Chickweed infusion	Wound healing, antirheumatic, astringent [27]
6	<i>Cinnamon species</i>	Cinnamon oil	Antifungal, uterine stimulant, antibacterial [27]
7	<i>Artemisia pallens</i>	Davana oil	Coughs, including menstruation, anxiety, healing of wounds, antiseptic [27]
8	<i>Canarium luzonicum</i>	Elemi oil	Coughs, healing wounds, stress [27]
9	<i>Eucalyptus citriodora</i>	<i>Eucalyptus citriodora</i> oil	Fever and flu, to improve blood circulation and sinusitis, arthritis, bronchitis, catarrh, cold stores, colds and coughs [27]
10	<i>Eucalyptus globulus</i>	<i>Eucalyptus</i> oil	Antiseptic, antispasmodic, treatment of scarlet fever, influenza, measles and typhoid, infusion reduces blood sugar levels [27]
11	<i>Alpinia galanga</i>	Galanga oil	Aphrodisiac, easing heart pain and angina, dizziness and fatigue. Stomach, spleen, relief of pain, treatment of flu and colds, travel sickness [27]
12	<i>Pelargonium graveolens</i>	Geranium oil	Acne, cellulites, lice treatment, menopause [27]
13	<i>Zingiber officinalis</i>	Ginger oil	Promotes sweating, expectorant, prevents vomiting, antiseptic, anti-spasmodic, carminative, antibacterial, circulatory stimulant, nausea, relaxes peripheral blood vessels, promotes sweating [27]
14	<i>Hyssopus officinalis</i>	Hyssop oil	Nervous exhaustion, anxiety, used topically as an anti-inflammatory, bruises and anti-viral, increases alertness, uplifting and relaxing nerves [27]
15	<i>Ammi visnaga</i>	Khella oil	Antiasthmatic, diuretic, antispasmodic, relaxant [27]
16	<i>Citrus Limon</i>	Lemon oil	Blemishes, varicose veins, warts, chilibains, colds, corns, flu, skin, athletes foot [27]
17	<i>Backhousia citriodora</i>	Lemon myrtle oil	Insect repellent, stress, athletes foot, colds, flu, skin blemishes [27]
18	<i>Citrus reticulata</i>	Mandarin oil	Blemishes, stress and wrinkles, acne, insomnia, scars, skin [27]
19	<i>Mentha species</i>	Mint oil	Analgesic, calming, cooling for migraines, anti-bacterial, clear nasal congestion, prevents vomiting, relaxes peripheral blood vessels, promotes bile flow [27]
20	<i>Myrtus communis</i>	Myrtle oil	Sore throat, asthma, coughs [27]
21	<i>Piper nigrum and other species</i>	Pepper oil	Aches and pains, coughs, chills, cramps, digestion, antiseptic, anti-bacterial, topical use increases blood flow around area [27]
22	<i>Zingiber cassumunar</i>	Plai oil	Uterine relaxant, inflammatory [27]

S. no.	Plant species	Essential oil	Uses
23	<i>Rosa species</i>	Rose oil	Astringent, sedative, digestive stimulant, increase bile production, expectorant, anti-bacterial, antiseptic, kidney tonic, blood tonic, anti-depressant, anti-spasmodic, aphrodisiac [27]
24	<i>Mentha spicata</i>	Spearmint oil	Flu and fever, nausea, vertigo, asthma, exhaustion [27]
25	<i>Citrus sinensis</i>	Sweet orange oil	Constipation, cough relief, flu, gum treatment, calms nerves, digestive stimulant, aids energy
26	<i>Tagetes glandulifera and patula</i>	Tagetes oil	Warts and corns [27]
27	<i>Vetiveria zizanoides</i>	Vetivert oil	Insomnia, muscle aches, sores and stress, acne, cuts, anti-depressant, exhaustion [27]
28	<i>Viola odorata</i>	Violet leaf absolute	Poor blood circulation, sore throat, bronchitis, head ache, insomnia, rheumatism [27]
29	<i>Melaleuca alternifolia</i>	Tea tree oil	Fungal, antiseptic, anti-viral, candida, cold sores, corns, cuts, flu, anti-bacterial [27]
30	<i>Cananga odorata</i>	Ylang oil	Hypertension, palpitations, stress, anxiety, anti-depression, frigidity, hypertension [27]
31	<i>Zanthoxylum alatum</i>	Leaf, stem, root oil	Antioxidant, antifungal, antibacterial [28]
32	<i>Skimmea laureola</i>	Leaf oil	Antioxidant, antifungal, antibacterial and perfumery [29]
33	<i>Angelica glauca</i>	Root oil	Antioxidant, antifungal, antibacterial, and phytotoxicity [30]
34	<i>Thymus serpyllum</i>	Whole plant oil	Antioxidant, antifungal, antibacterial, and phytotoxicity [31]
35	<i>Plectranthus rugosus</i>	Leaf oil	Antifungal, antioxidant, antibacterial [32]

Table 1.
 Some plant species essential oils and their uses.

7. Conclusion

Essential oils are the natural volatile compounds having loveable odor. The essential oils are isolated mostly from the hydrodistillation method which is more suitable for this process and easy to carry. Whole parts of the plants are used for the extraction of plants. Steam distillation method is expensive than the hydrodistillation, so it is less preferred. Essential oils have good medicinal applications and used in the treatment of different diseases including the infectious diseases, depression, anxiety, act as the antifungal, antimicrobial, anticancer, and wound healing; they are also used in cosmetics and perfume industries. In the field of health, essential oils are used more frequently and are mostly applied to the external body parts to relieve the pain. In the field of fragrance, essential oils are used in the perfume industry and due to attractive odor, the essential oils are used mostly in this industry. It is used worldwide and due to their better usage, the world essential oil market is growing rapidly and getting more importance day by day.

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Conflict of interest

Author has no conflict of interest.

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References

- [1] Abu-Shanab B, Adwan GM, Abu-Safiya D, Jarrar N, Adwan K. Antibacterial activities of some plant extracts utilized in popular medicine in Palestine. *Turkish Journal of Biology*. 2005;**28**(2-4):99-102
- [2] Kelen M, Tepe B. Chemical composition, antioxidant and antimicrobial properties of the essential oils of three salvia species from Turkish flora. *Bioresource Technology*. 2008;**99**(10):4096-4104
- [3] Celiktas OY, Kocabas EH, Bedir E, Sukan FV, Ozek T, Baser KH. Antimicrobial activities of methanol extracts and essential oils of *Rosmarinus officinalis*, depending on location and seasonal variations. *Food Chemistry*. 2007;**100**(2):553-559
- [4] Lee MS, Choi J, Posadzki P, Ernst E. Aromatherapy for health care: An overview of systematic reviews. *Maturitas*. 2012;**71**(3):257-260
- [5] Tepe B, Daferera D, Tepe AS, Polissiou M, Sokmen A. Antioxidant activity of the essential oil and various extracts of *Nepeta flavida* hub-Mor. from Turkey. *Food Chemistry*. 2007;**103**(4):1358-1364
- [6] Rios JL, Recio MC. Medicinal plants and antimicrobial activity. *Journal of Ethnopharmacology*. 2005;**100**(1-2):80-84
- [7] Dorman HJ, Deans SG. Antimicrobial agents from plants: Antibacterial activity of plant volatile oils. *Journal of Applied Microbiology*. 2000;**88**(2):308-316
- [8] Pérez Gutiérrez RO, Hernández Luna H, Hernández Garrido S. Antioxidant activity of *Tagetes erecta* essential oil. *Journal of the Chilean Chemical Society*. 2006;**51**(2):883-886
- [9] Mimica-Dukić N, Božin B, Soković M, Mihajlović B, Matavulj M. Antimicrobial and antioxidant activities of three *Mentha* species essential oils. *Planta Medica*. 2003;**69**(05):413-419
- [10] Gilani AH, Khan AU, Jabeen Q, Subhan F, Ghafar R. Antispasmodic and blood pressure lowering effects of *Valeriana wallichii* are mediated through K⁺ channel activation. *Journal of Ethnopharmacology*. 2005;**100**(3):347-352
- [11] Kulisic T, Radonic A, Katalinic V, Milos M. Use of different methods for testing antioxidative activity of oregano essential oil. *Food Chemistry*. 2004;**85**(4):633-640
- [12] Bousbia N, Vian MA, Ferhat MA, Petitcolas E, Meklati BY, Chemat F. Comparison of two isolation methods for essential oil from rosemary leaves: Hydrodistillation and microwave hydrodiffusion and gravity. *Food Chemistry*. 2009;**114**(1):355-362
- [13] Donelian A, Carlson LH, Lopes TJ, Machado RA. Comparison of extraction of patchouli (*Pogostemon cablin*) essential oil with supercritical CO₂ and by steam distillation. *The Journal of Supercritical Fluids*. 2009;**48**(1):15-20
- [14] Hussain AI, Anwar F, Sherazi ST, Przybylski R. Chemical composition, antioxidant and antimicrobial activities of basil (*Ocimum basilicum*) essential oils depends on seasonal variations. *Food Chemistry*. 2008;**108**(3):986-995
- [15] Daferera DJ, Ziogas BN, Polissiou MG. The effectiveness of plant essential oils on the growth of *Botrytis cinerea*, *Fusarium* sp. and *Clavibacter michiganensis* subsp. *michiganensis*. *Crop Protection*. 2003;**22**(1):39-44
- [16] Van Vuuren SF, Viljoen AM, Özek T, Demirci B, Başer KH. Seasonal and geographical variation of *Heteropyxis*

natalensis essential oil and the effect thereof on the antimicrobial activity. South African Journal of Botany. 2007;**73**(3):441-8

[17] Grand Review Research Inc. US. Available from: <https://www.grandviewresearch.com/>

[18] Market Research Reports, Consulting: Global Market Insights Inc. [Internet]. Available from: <https://www.gminsights.com>

[19] Pakistan Statistical Year Book. Government of Pakistan, Statistical Division, Federal Bureau of Statistical; 2008

[20] Burt S. Essential oils: Their antibacterial properties and potential applications in foods—A review. International Journal of Food Microbiology. 2004;**94**(3):223-253

[21] Hajhashemi V, Ghannadi A, Sharif B. Anti-inflammatory and analgesic properties of the leaf extracts and essential oil of *Lavandula angustifolia* mill. Journal of Ethnopharmacology. 2003;**89**(1):67-71

[22] Mahato N, Sharma K, Koteswararao R, Sinha M, Baral E, Cho MH. Citrus essential oils: Extraction, authentication and application in food preservation. Critical Reviews in Food Science and Nutrition. 2019;**59**(4):611-625

[23] Aromatherapy Market Trend 2019: Increasing Sales of Essential Oils for Home Usage. 2019. Available from: <https://reportsuptodate.us/1390> [Accessed: April 20, 2019]

[24] Use Essential Oils for Perfume to Improve your Emotional and Physical Well Being [Internet]. 2015. Available from: www.experience-essential-oils.com/essential-oils-for-perfume.html

[25] Aromatherapy Market Trend 2019: Increasing Sales of Essential Oils for Home Usage. 2019. Available from:

<https://reportsuptodate.us/1390/aromatherapy-market-trend-2019-increasing-sales-of-essential-oils-for-home-usage/>

[26] Taylor J. The 10 Most Popular Essential Oils and 174 Magical Ways to Use Them. 2016. Available from: <https://www.naturallivingideas.com/author/jan/> [Accessed: April 12, 2016]

[27] Murry H. Essential Oils: Art, Agriculture, Science, Industry and Entrepreneurship (A Focus on The Asia-Pacific Region). Nova; 2009. pp. 626-633

[28] Irshad M, Aziz S, Ahmed MN, Asghar G, Akram M, Shahid M. Comparisons of chemical and biological studies of essential oils of stem, leaves and seeds of *Zanthoxylum alatum* Roxb growing wild in the state of Azad Jammu and Kashmir, Pakistan. Records of Natural Products. 2018;**12**(6):638

[29] Irshad M, Aziz S, Shahid M, Ahmed MN, Minhas FA, Sherazi T. Antioxidant and antimicrobial activities of essential oil of *Skimmea laureola* growing wild in the state of Jammu and Kashmir. Journal of Medicinal Plant Research. 2012;**6**(9):1680-1684

[30] Irshad M, Shahid M, Aziz S, Ghous T. Antioxidant, antimicrobial and phytotoxic activities of essential oil of *Angelica glauca*. Asian Journal of Chemistry. 2011;**23**(5):1947

[31] Aziz S, Habib-ur-Rehman, Irshad M, Asghar SF, Hussain H, Ahmed I. Phytotoxic and antifungal activities of essential oils of *Thymus serpyllum* grown in the state of Jammu and Kashmir. Journal of Essential Oil-Bearing Plants. 2010;**13**(2):224-229

[32] Irshad M, Aziz S, Habib-ur-Rehman, Hussain H. GC-MS analysis and antifungal activity of essential oils of *Angelica glauca*, *Plectranthus rugosus*, and *Valeriana wallichii*. Journal of Essential Oil-Bearing Plants. 2012;**15**(1):15-21