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## REVIEW ON PHARMACEUTICAL FORMULATIONS INVOLVING ESSENTIAL OILS

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### ABSTRACT

Essential oils have also demonstrated analgesic, anti-inflammatory, antioxidant, antibacterial, antifungal, dreamy, and antidepressant, goods, and through topical operation, can effectively heal becks and nonentity mouthfuls, thus they can be used in the treatment of skin injuries. This effect is related to their capability to damage the bacterial cell wall or cell membrane, therefore adding cell membrane permeability and solubilization, with the consequent release of membrane proteins, leading to bacteriostatics. Despite the veritably promising medicinal conditioning, some factors limit the pharmaceutical operation of essential oils as antimicrobial agent in tropical treatment, substantially because their directly exposure to the skin could potentially induce an antipathetic response.

### KEYWORDS

Essential oils, Anti-cancer activity and Promote wound healing.

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### INTRODUCTION

Essential oils are volatile, liquid or semi-liquid lipophilic complex mixtures of low molecular weight organic compounds produced by plants as secondary metabolites whose major components are monoterpenoids and sesquiterpenoids, phenylpropanoids and short chain aliphatic compounds. Due to the chemical structure of their constituents, EOs can be easily degraded after exposure to moisture, heat, oxygen and light, as a result of chemical and enzymatic reactions (oxidation, isomerization, cyclization and

dehydrogenation), which can occur during production and handling process<sup>1</sup>.

Essential oils are widely used in the cosmetic, pharmaceutical, medicinal and food industries as antibacterial, antifungal and antiviral agents<sup>2</sup>. They possess antioxidant and anti-inflammatory activity, anti-cancer activity<sup>3</sup>, promote wound healing<sup>4</sup>, can replace conventional preservatives<sup>5</sup> pesticides<sup>6</sup> and play many other biological roles<sup>7</sup>. Numerous natural exertion of essential paintings and their members are universally used to preclude and treat numerous natural sicknesses<sup>8</sup>. Today, essential oils are the subject of intense scientific research and also attract the attention of the cosmetic and pharmaceutical industry for their potential as active pharmacological compounds or natural preservatives. A new promising field of application of essential oils as natural preservatives in cosmetics or food additives in human or animal nutrition or as crop protection agent has been studied. It is estimated that more than 3000 essential oils are of commercial importance and are used in the aroma and cosmetic industry<sup>9</sup>.

## EXTRACTION METHODS FOR ESSENTIAL OILS

Different parts of different aromatic plants can be extracted to form essential oils which then have many uses in cosmetics, pharmaceuticals and food safety. The production method and technique used to extract essential oils depends on the characteristics and components required in the botanical extract. The most important factor in ensuring the quality of essential oils is the extraction method used, as incorrect extraction procedures can lead to destruction and alter the action of phytochemicals in aromatic oils. The resulting effects can be, for example, loss of pharmacological components, color effect, taste/odor and physical alteration of essential oils<sup>10</sup>. These extraction techniques can be classified into two categories: classical methods and innovative methods. The application of innovative techniques, such as improved ultrasonic and microwave processes, improved the efficiency of the extraction

process in terms of the time required for essential oil isolation and energy dissipation, as well as improving the production efficiency and high quality of essential oils<sup>11</sup>.

### Conventional extraction methods

Conventional techniques used to extract essential vegetable oils are based on the distillation of water through heating<sup>11</sup> such as Hydrodistillation, Steam distillation, Hydrodiffusion, Solvent extraction, Dissolvable extraction, Gas chromatography (GC), Gas chromatography-mass spectroscopy investigation (GCMS).

### Innovation of extraction methods

The further modification of extraction techniques is due to several drawbacks of conventional methods that prompt essential oils to undergo chemical changes such as hydrolysis, isomerization and oxidation. These processes involve high temperatures and affect the quality of essential oils, while extending the extraction period. In terms of the process of extracting essential oils, it is very important to preserve the chemical components and the natural proportion of the oils in their original state. The parameters to be taken into account in new extraction techniques are the reduction of the extraction period, energy consumption, solvent used and carbon dioxide emissions<sup>11</sup>. Supercritical fluid extraction, Subcritical extraction liquid, solvent free microwave extraction.

## PHARMACEUTICAL AND THERAPEUTIC POTENTIALS OF ESSENTIAL OILS:

The uses of essential oils in the pharmaceutical field are widely discussed and studied by many scientists, especially their function as anticancer, antimicrobial, antiviral agents and as agents that improve skin permeability. The main points of the earlier findings are discussed in the following paragraphs.

### Essential oils and cancer

Initially, essential oils were identified and used to treat inflammatory and oxidative diseases. The oils react with oxygen species that have been linked to causing oxidation and inflammation that can lead to

cancer, showing that essential oils also have the ability to be an anticancer agent<sup>12</sup>.

#### **Essential oils as antibacterial agent**

The use of aromatic plants as antibacterial agents to inhibit bacterial growth and prevent rot has been practiced since ancient times. Scientifically, several studies have reported the potential of essential oils to inhibit the growth of bacteria in many areas.

#### **Essential oils as antiviral agent**

Several infectious diseases are caused by certain agents called viruses, and in the meantime, many types of drugs are available as antivirals. Essential oil extracts from aromatic plants have been evaluated for their performance as an antiviral agent, including essential oils commonly used in culinary applications<sup>13</sup>.

#### **Essential oil as skin penetration enhancers for transdermal drug delivery**

Several areas involved in the application of essential oils are the cosmetic, pharmaceutical and food industries while their potential as anticancer, antibacterial, antiviral and anti-inflammatory agents has been studied and evaluated. Many human diseases have been reported to be treated with essential oils because of their many biological activities. Therefore, studies have been conducted to evaluate these aromatic plants as suitable permeation activators to increase the percutaneous absorption of various drugs when applied topically through the lower layer of the skin.

### **ESSENTIAL OILS AND THEIR USES**

#### **Peppermint oil**

**Synonyms:** Brandy mint.

#### **Botanical source**

It is the oil obtained by the refining of *Mentha piperita*, having a place to the family Labiatae.

#### **Cultivation and collection**

Peppermint thrives best in a sufficiently warm, ideally humid climate with deep, well-depleted soils rich in humus. Peppermint will grow efficiently, once it's started to grow carefully. The normal development strategy is to bury the runners in early spring and place them in shallow trenches, 3 feet apart in well-prepared soil. The developing edition

is well grown and completely weeds free and in summer when the plant is in full bloom the mint are hand cut and refined in straw. Some of the exhausted grass is dried and used for animal feed.

#### **Characteristics**

The takes off are in the blink of an eye and particularly stalked, 2 inches long and  $\frac{3}{4}$  to 1.5 inches wide. The edges are finely toothed, with smooth upper and lower surfaces. The stem are 2 to 4 feet tall, habitually purplish in colour. The flowers are purple-red, growing in the axils of the upper leaves, forming loose, intermittent spikes. This plant has a characteristic odor and if it is applied to the tongue it first tastes hot and fragrant, then produces a cold sensation in the mouth due to the menthol contained in it.

#### **Chemical constituents**

Menthyl acetate, Isovalerate, Menthone, Cineol, Inactive pinene, and Limonene are the major constituents of peppermint oil.

#### **Uses**

It is Stimulant, Colic, Destroying, Swelling and Colic; in some indigestion, sudden pain, cramps in the abdomen and also cholera and diarrhea.

#### **Lemongrass oil**

#### **Synonyms**

East Indian lemongrass, Malabar, or cochinchin lemongrass.

#### **Biological sources**

*Cymbopogon flexuosus* (syn. *Andropogon Nardusvar. flexuosus* Hack.) belongs to the Poaceae family and produces lemongrass oil. It has a minimum of 75% aldehydes estimated as citral in it.

#### **Plant description**

It's a tropical, scented, perennial grass with strap-like leaves that emerge from short branched rhizomes. It reaches a height of 1 to 2 metres and a width of 0.5 to 1 metre. It only produces flowers on rare occasions. It has a nodding, pinkish glow and a length of 30 to 60cm. The peduncle is linear oval, slightly reddish globose, 6-10mm long.

#### **Chemical constituents**

**Monoterpenes:** Terpinolene, limonene, myrcene.

**Terpenoids:** Geranial, neral, citral.

**Phenolic compound:** Terpeneol, geraniol, borneol.

### Uses

Citral is used to prepare the violet flavor.

Mosquito repellents.

It is also used in the manufacture of soaps, cosmetics and perfume.

### Cedar wood oil

**Synonyms:** Atlas cedar.

**Botanical source:** *Juniperus virginiana*

**Family:** Abiataceae; Pinaceae

### Plant details

Cedar is an evergreen tree with a height of 3,040 meters (sometimes 60 meters), wood with a pungent, resin odor, thick ribbed or square and cracked bark, and broad horizontal branches. Its origin is France. The parts used are bark, wood. Scent: woody, warm, dry, acid.

### Chemical composition

The main chemical components of cedar oil are coniferene, dicedarene, limonene, other sesquiterpenes, cedarol and vidol.

### Uses:

Antiseborrhoeic, antiseptic, antispasmodic, tonic, astringent, diuretic, emmenagogue, expectorant, insecticides, sedative and fungicide.

### Eucalyptus oil

**Synonyms:** Eucalyptus camphora, Blue gum.

### Biological sources

It is obtained from *Eucalyptus globules* Labill tree. It is an aromatic tree of the Myrtle family.

### Plant description

It usually reaches a height of 150-180 feet. Its torso is straight, up to two-thirds of its total height, and its crown is well developed. The leaves are shiny, dark green, thick, and leathery. Their average length is 5.9 to 5.9.

### Chemical composition

Eucalyptus oil is a complex mixture of a variety of monoterpenes and sesquiterpenes, aromatic phenols, oxides, ethers, alcohols, esters, aldehydes and ketones, such as 1, 8-cinnamyl alcohol (eucalyptol), citronellal, incense Thorn alcohol, citronellol acetate.

### Uses

Disinfect wounds, breath easy, control blood sugar, freshen breath.

### Tea tree oil

**Synonyms:** Melaleuca oil.

### Biological sources

It's made from the leaves of *Melaleuca alternifolia*, an Australian tea tree endemic to southeastern Queensland and the northeast coast of New South Wales.

### Chemical constituents

Terpinen-4-ol, 1, 8-cineole, Terpinolene, p-cymene, limonene, sabinene, aromadendrene<sup>14</sup>.

### Characteristics

Tea tree oil, also known as Melaleuca oil, is an essential oil with a refreshing camphor smell, the color varies from pale yellow to almost colorless and transparent.

### Uses

Skin care, acne, haircare, cleaner, anti-inflammatory, expectorant, immunity boosting, personal care products.

### Future market of essential oils

Due to increasing popularity of aromatherapy, essential oils are growing at significant rate. The growth of particular essential oil depends upon its increasing application in different sectors and rising awareness about its health benefits among consumer.

### ENDANGERED ESSENTIAL OIL EXTRACTS

Due to the strong global demand coupled with numerous threats is driving these plants to extinction. The critically endangered essential oils are Spikenard (*Nardostachys jatamansi* a.k.a. *N. grandiflora*) in India, Nepal, Bhutan, Myanmar, SW China and Sandalwood (*Santalum album*) in Timor Leste. The endangered essential oils are Rosewood (*Anibarosaeodora*) in Peru, Brazil, Colombia, Ecuador, French Guiana, Guyana, Suriname, Venezuela Atlas cedarwood (*Cedrus atlantica*) in Algeria and Morocco<sup>15</sup>.

## ESSENTIAL OILS AND THEIR USES

**Table No.1: Essential oil and their uses**

S.No	Essential oils	Uses
1	Peppermint oil	It is used as stimulant, colic, destroying, swelling, indigestion, sudden pain, cramps.
2	Lemongrass oil	Mosquito repellent and also used in manufactures of soaps, cosmetics and perfume.
3	Cedar wood oil	It is used as an antiseborrheic, antiseptic, antispasmodic, tonic, astringent, diuretic, expectorant,
4	Eucalyptus oil	It is used as disinfectant wound, breath easy, control blood sugar, freshen breath.
5	Tea tree oil	It is used as skin care acne, haircare, cleaner, anti inflammatory, expectorant, immunity boosting, personal care products.

## PHARMACOGNOSTICAL STUDY OF ESSENTIAL OILS

**Table No.2: Botanical name of essential oil**

S.No	Common names	Botanical names
1	Peppermint	<i>Mentha piperita</i>
2	Eucalyptus	<i>Eucalyptus globulus</i>
3	Cedar wood	<i>Juniperus virginiana</i>
4	Lemongrass	<i>Cymbopogonflexuosus</i>
5	Tea tree	<i>Melaleuca alternifolia</i>

## PHARMACEUTICAL FORMULATION OF ESSENTIAL OILS

**Table No.3: Pharmaceutical formulations of essential oils**

S.No	Essential oils	Pharmaceutical products
1	Peppermint oil	Lamberts peppermint oil capsules. Gaviscon peppermint tablet. Whipped peppermint cream Colpermin IBS relief capsules.
2	Lemongrass oil	Blown away hand cream wild lemon grass Lemon grass Anti-pigmentation cleansing cream Anita's lemongrass butter Soul and scents lemongrass home fragrance
3	Cedar wood oil	Nature botanical personal insect repellent Aroma therapy moisturizing body cream Geranium cedarwood hair treatment
4	Eucalyptus oil	ZEN-BREATH eucalyptus oil soft gel capsules SWASTIK life science eucalyptus capsules. EBKANUNM soft gel capsules. Eucalyptus Nourishing body cream
5	Tea tree oil	Atorainaoishi aroma oil tablet Tea tree soap base Haeal tea tree oil cleansing soap Pelle tea tree face gel Mama earth tea tree oil-free face moisturizer



**Figure No.1: Essential oils**



**Figure No.2: Peppermint leaves**



**Figure No.3: Lemon Grass oil**



**Figure No.4: Cedar wood oil**

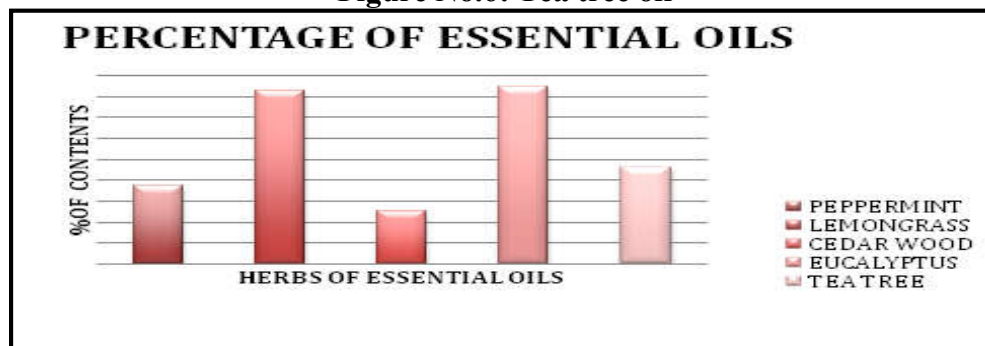




**Figure No.5: Eucalyptus oil**



**Figure No.6: Tea tree oil**



**Figure No.7: Comparison of content of essential oils**

## CONCLUSION

It is concluded that essential oils have good medicinal uses and are used in the treatment of various diseases including infectious diseases, depression, anxiety, acting as antifungals, antimicrobials, anticancer and wound healing; they are also used in the cosmetics and perfume industries. The hydro distillation method, which is better suitable for this process and easy to carry, is primarily used to isolate essential oils. Whole parts of plants are used for plant extraction. The steam distillation method is more expensive than hydro

distillation and is therefore less preferred. In the health field, essential oils are more commonly used and are mainly applied to the external parts of the body for pain relief. In the field of perfume, essential oils are used in the perfume industry and because of their attractive fragrance. In the cosmetics and perfume industries, they're also used. It is used all over the world and due to their better uses, the global essential oil market is growing rapidly and becoming more important by the day.

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## CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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