

# Potential herbal essential oils: Are they super natural skin protector?

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**ABSTRACT**

Humans have a natural desire to seem younger and more appealing. They rely on a variety of skin care treatments, both herbal and chemical-based, to achieve this goal. Chemicals, on the other hand, have a slew of negative side effects that beauty-conscious individuals find unacceptable. As a result, herbal components are widely recommended since they are completely harmless. In this review article, scientific studies of species are reported, which are rosehip seed, carrot seed, frankincense, geranium, lavender, neroli, myrrh, tea tree, rose, patchouli, ylang-ylang, salvia, sandalwood, pomegranate, turmeric, neem and Neral, germacrone, philanderer, geranial, citronellal, terpinolene, 1, 8 cineol, camphor, limonene, methyl-thujane, and carvacol are some of the essential oils used in aromatherapy that were the major chemical components of essential oils that exhibited a percentage higher relative abundance, 20%. Most of the mentioned species, describe investigations of anti-inflammatory, antioxidant, and anti-proliferative activity shown by essential oils. In recent study, some researches herbal essential oils are one of the best candidate due to its features such as anti-inflammation, antioxidant, antiproliferative, activities as well as anti-pigmentation activity and antifungal and antitumor, antimetabolic activity in human dermal fibroblasts, and skin epidermal cancer cells. Although essential oils are deemed safe and nontoxic when used in small amounts, research evidence suggests that essential oils and their constituents have a high allergy potential. As a result, the research recommends the use of certain essential oils for skin care and the treatment of specific skin problems.

**Keywords:** Essential oil, Herbs, Skin disease, Phytochemicals, Cosmetics

## Introduction

The human body's skin is one of its most important defensive organs. It performs a variety of functions, including protection, thermoregulation, percutaneous absorption, secretory, and sensory functions. Dryness, ageing, eczema, acne, pimples, dullness, wrinkles, unpleasant spots, and other issues impact the skin. Several environmental factors, such as dust, heavy metal, particulate matter, UV radiation, and others, contribute to skin issues. This sort of skin illness is treated using skin care products. These items include a variety of chemical poisons. As a result, the allopathic system is inadequate for healthy benefits, and<sup>[1]</sup> must be chosen. Seeds, bark, leaves, berries, roots, rhizomes, seeds, stems, fruits, and flowers are all used to extract essential oils. Antioxidant, anti-

inflammatory, antiseptic, emollient, anti-seborrheic, anti-keratolytic, and antibacterial characteristics are found in the essential oil of these plants. Each essential oil contains active compounds that have substantial skin-care cosmetic benefits. The components in the herbs have no negative effects on the skin of the human body, but rather provide important nutrients to the skin.<sup>[2]</sup> Essential oils, their constituents, are frequently employed in cosmetics due to their many applications. Analgesic, hyperemic, antiseptic, carminative, antibacterial, diuretic, spasmolytic, and stimulatory are some of their biological actions.<sup>[1]</sup> Their lovely perfume is the primary reason for their use in cosmetics. As a result, effective perfume combinations are applied to these goods to cover it.

Cosmetics are defined as "any material or combination intended to be placed in interaction with the different environmental parts of body (epidermis, hair system, nails, lips, and external genital organs) as well as the teeth and oral mucous membranes for the sole or primary purpose of cleaning, disinfecting, changing their looks, safeguarding them, maintaining them in excellent condition, or correcting body odors."<sup>[2]</sup>

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Cosmetics such as creams, gels, and ointments including 1 essential oil or a multiple ingredient as API (e.g., rosemary oil and eucalyptus oil) must not always need a because essential oils have antibacterial and antifungal effects, they need an additional chemical preservative.<sup>[3]</sup> Lipophilic, tiny, and non-polar molecules make up the majority of essential oils. They have the ability to quickly penetrate the skin and exert actions there.<sup>[11]</sup> Two types of rosemary oil application were tested in this study: A gel having rosemary essential oil and a gel containing lipid nanoparticles loaded with rosemary essential oil. According to the findings, oil-loaded lipid nanoparticles were more beneficial to dry skin with low bounciness.<sup>[2]</sup> Essential oils and fragrances may be sources of possible allergens, thus specialists convened at the international organization. International Fragrance Association specified which essential oils and which of its components may cause an allergic reaction. To produce cosmetics that are safe, they also determined the maximum concentration.<sup>[3]</sup>

## Can Essential Oils of Different Herbs Used in Skin Disease?

Conventionally, variety of plant-based products are being used for prophylaxis and cure of many diseases. Herbal plants belonging to family rutaceae, burseraceae, rosaceae, geraniaceae, and teaceae, and many more contain enormous chemical constituents with well-known therapeutic effects against health ailments. One of the important and effective constituent of herbs is essential oil. We are using these essential oils from decades due to their activity and pleasant aroma. Some of these essential oils are discussed in the present study.

### Essential oil: Rosehip

Rose hip seed oil is a pressed seed oil made from the seeds of the *Rosa rubiginosa* shrub, which belongs to the Rosaceae family. Provitamin A is present in the oil (mostly beta-Carotene). It has been incorrectly labeled as containing retinol (Vitamin A), a vitamin produced primarily by animals from pro-vitamin A. It has a high concentration of important fatty acids such as oleic, polyunsaturated, and gamma linoleic acid, which contribute to skin texture and moisture. The oil is abundant in Vitamin C, an essential anti-aging element, as well as retinoid, which helps to brighten the face and battle acne. Topical use of rosehip seed oil reduces post-surgical scarring and inflammation.<sup>[11]</sup> Rosehip oil, according to a research, significantly improves crow's-foot wrinkles, skin suppleness, and moisture levels.<sup>[4]</sup> Furthermore, this oil has the ability to reduce inflammation and relieves irritation, making it ideal for persons with eczema. This is due to the fact that rosehip seed oil is abundant in vital fatty acids and antioxidants, including pro-Vitamin A, which provides excellent protection against skin irritation and oxidative damage.<sup>[4]</sup>

### Essential oil: Carrot seed

It is an essential oil obtained from the seed of the carrot plant *Daucus carota*, which belongs to the Apiaceae family. Three flavones in carrot seed extract are pharmacologically active: luteolin, luteolin 3'-O-beta-D-glucopyranoside, and luteolin 4'-O-beta-D-glucopyranoside. Antioxidant properties have been discovered in the

essential oil extracted from the seeds.<sup>[5]</sup> It contains antioxidants that are effective in neutralizing free radicals that cause inflammation and wrinkles.<sup>[6]</sup> This essential oil is abundant in flavonoids and carotenoids, which may help to reduce inflammation.<sup>[7]</sup>

### Essential oil: Frankincense

True frankincense is produced by numerous species of *Boswellia*. Burseraceae includes *Boswellia sacra* (syn. *Boswellia bhaw-dajiana*, syn. *Boswellia carteri*), *Boswellia frereana*, *Boswellia serrata* (*Boswellia thurifera*, Indian frankincense), and *Boswellia papyrifera*. This is fantastic for all skin types, including acne and blemish-prone skin, aging skin, dry skin, and so on. Due to its anti-inflammatory and antibacterial qualities, Frankincense essential oil is beneficial to acne-prone skin.<sup>[8]</sup> It is a strong astringent; therefore, it is fantastic for decreasing wrinkles, fine lines, scars, and stretch marks on the skin.<sup>[9]</sup> In addition, frankincense essential oil encourages the formation of new cells, preserves skin suppleness, and soothes dry, chapped skin.<sup>[8]</sup> It aids in the reduction or prevention of sunspots and age spots, and thereby evens out the skin tone.<sup>[9]</sup>

### Essential oil: Geranium

Pelargonium graveolens essential oil is derived from the Geraniaceae plant Pelargonium graveolens. Linalool, geranyl Formate, citronellol, and geraniol are the key chemical constituents of geranium essential oil, which makes it effective for acne and blemish-prone skin, dry skin, ageing skin, dermatitis, and eczema. It is regarded as a potent anti-inflammatory agent.<sup>[10]</sup> It is possible to keep great skin elasticity and smooth skin using this oil. It also improves blood flow to the skin, which aids in the healing of bruises, burns, wounds, broken capillaries, ringworm, dermatitis, Eczema, and other skin disorders. Geranium essential oil is antimicrobial, antibacterial, and antiseptic in nature, and when used topically, it may reduce acne outbreaks, skin irritations, and infections.<sup>[7]</sup> It accelerates wound healing and the regeneration of new skin cells since it is a natural cicatrissant. In persons with acne, the oil has also been researched for its potential moisture balance and skin cell regeneration.<sup>[11]</sup>

### Essential oil: Lavender

*Lavandula angustifolia* is a Lamiaceae plant from which lavender essential oil is extracted. Lavender has a distinct perfume that is distinguished by its calming effects. Its essential oil has a wonderful scent, and it is often used in aromatherapy since it may help us relax our bodies and minds, as well as adapt to stress. It also has the potential to be beneficial to the skin. The anti-inflammatory effects of lavender essential oil are well-known.<sup>[12]</sup> It has the ability to speed up wound healing and improves the collagen manufacturing system.<sup>[13]</sup> According to a research, this essential oil protects the brain against oxidative stress.<sup>[14]</sup> As a result of these anti-oxidant properties, furthermore, lavender essential oil aids in the production of powerful antioxidants such as glutathione, catalase, and superoxide dismutase.<sup>[13]</sup> Lavender essential oil blended with *Aloe vera* or coconut oil may have very beneficial benefits on the skin due to its antibacterial and antioxidant properties.<sup>[14]</sup> Lavender essential oil improves skin circulation, allowing oxygen, and other nutrients to reach the skin for repair and healing.<sup>[13]</sup>

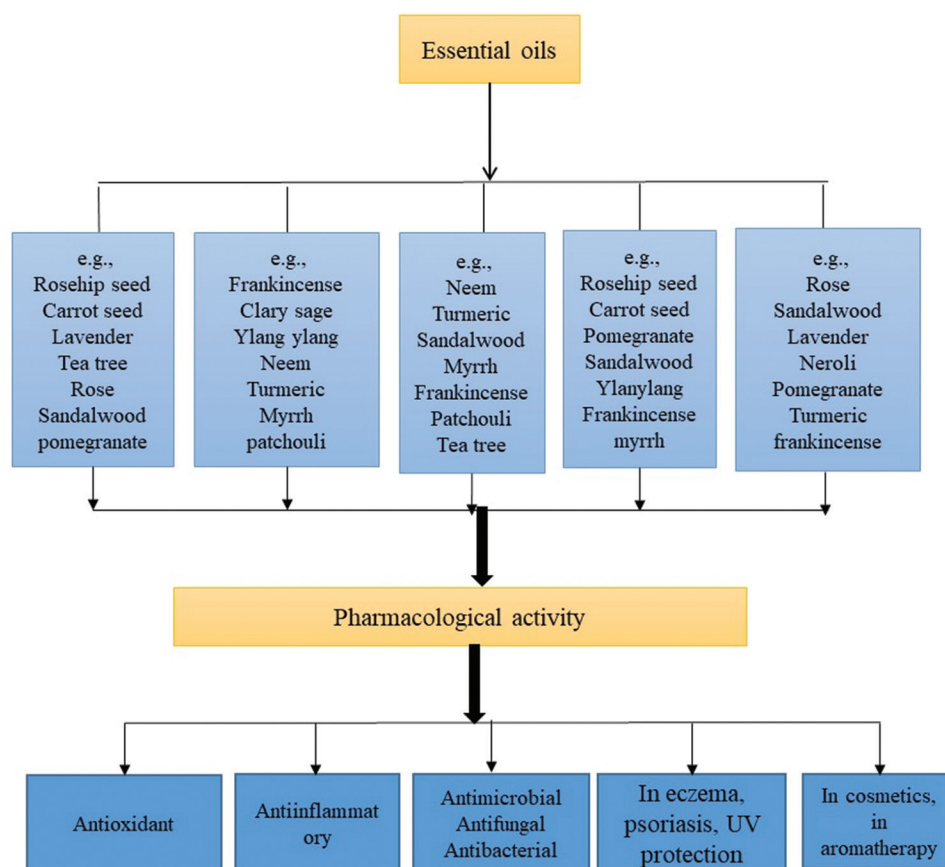


Figure 1: Essential oils and their activity

### Essential oil: Neroli

Neroli essential oil is derived from the blooms of the bitter orange tree (*Citrus aurantium*), which belongs to the Rutaceae family. It includes 0.62%–19.08%-pinene, 0.53%–94.67% limonene, 3.11%–6.06% transocimene, 0.76%–58.21% linalool, and 0.13%–12.89% – terpineol.<sup>[15]</sup> It has a lot of antioxidant and anti-inflammatory effects, so it is great for your skin. This oil includes citral, a natural substance that promotes cell regeneration. As a result, it is great for preventing and treating stretch marks, fine wrinkles, and other skin problems. The antibacterial qualities of neroli essential oil may help to mend blemish-prone skin,<sup>[15]</sup> and it can also be used to treat fungal diseases such as athlete’s foot and jock itch. The oil may also be used to cure wrinkles by improving skin suppleness.<sup>[7]</sup>

### Essential oil: Myrrh

*Commiphora myrrha* (family Burseraceae) and other *Commiphora* species produce myrrh, which is a resinous secretion. In the event of aging, chapped, or irritated skin, myrrh essential oil is often utilized. It is concerned with antioxidant characteristics.<sup>[16]</sup> Myrrh is one of the most effective essential oils for treating skin irritations and chapped skin.<sup>[17]</sup> Curzerene (40.1%), furanoeudesma-1,3-diene (15.0%), -elemene (8.4%), and 2-0-acetyl-8,12-epoxygermacra-1(10),4,7,11-tetraene, isomer I (6.5%) were determined to be the primary ingredients in this oil. Myrrh is one of the most effective essential oils for treating

skin irritations and chapped skin.<sup>[16]</sup> When used topically, it may help speed wound healing and combat infection-causing microorganisms. It also prevents the spread of certain skin fungus, such as ringworm and athlete’s foot.<sup>[17]</sup>

### Essential oil: Tea tree

The oil is derived from the needle-like leaves of the tea tree *Melaleuca alternifolia*, which belongs to the Teaceae family of plants, and it has long been used as a herbal medicine for a number of health issues, mostly skin issues. Its anti-inflammatory, anti-bacterial, anti-fungal, and anti-viral characteristics make it one of the finest essential oils for acne and blemish-prone skin.<sup>[18]</sup> Tea tree oil’s antibacterial qualities may help expel acne-causing germs and speed wound healing. It has the ability to control oil production and so prevent breakouts from occurring.<sup>[19]</sup> It also aids in the battle against germs and inflammation, two factors that contribute to acne outbreaks.<sup>[19]</sup>

### Essential oil: Rose

It is obtained from species of *Rosa sup* family Rosaceae. The chemical constituents of rose essential oil are citronellol, geraniol, nerol, linalool, phenylethylalcohol, farnesol, stearoptene,  $\alpha$ pinene,  $\beta$ pinene,  $\alpha$ terpinene, limonene, pcymene, camphene,  $\beta$ caryophyllene, neral, citronellylacetate, geranylacetate, nerylacetate, eugenol, methyleugenol, roseoxide,  $\alpha$ damascenone, and  $\beta$ damascenone.<sup>[19]</sup> Rose essential oil has a number of medicinal chemicals, mostly antibacterial

and anti-inflammatory components, that improve skin healing, texture, and tone.<sup>[20]</sup> It helps to decrease redness, puffiness, and enhance stressed-looking skin thanks to its anti-inflammatory properties. This may also help with skin conditions such as psoriasis and dermatitis. According to a research, inhaling rose essential oil may help to prevent moisture loss from the skin.<sup>[21]</sup>

### Essential oil: Patchouli

Patchouli is *Pogostemon cablin* with family Lamiaceae. Patchouli alcohol, -patchoulene, -bulnesene, seychellene, norpatchoulene, pogostone, eugenol, and pogostol are the primary phytochemical substances.<sup>[22]</sup> One component of patchouli oil has been shown to be capable of reducing chemically induced edema in the paws and ears of mice.<sup>[23]</sup> Mice given patchouli oil before being exposed to UV radiation were shown to have possible protective benefits, according to a study.<sup>[22]</sup>

### Essential oil: Ylang-ylang

It is obtained from *Cananga odorata* family Annonaceae. Due to its beautiful and rich floral aroma, ylang-ylang essential oil is regarded as one of a kind across the globe. Monoterpene hydrocarbons, oxygen-containing monoterpenes, sesquiterpene hydrocarbons, oxygen-containing sesquiterpenes, benzenoids, acetates, benzoates, and phenols were found in ylang-ylang essential oil. It is appropriate for all skin types.<sup>[24]</sup> Ylang-ylang essential oil possesses antioxidant properties that aid in the regeneration of skin cells. It aids in the improvement of skin elasticity and the reduction of fine lines.<sup>[25]</sup> Ylang-ylang essential oil, in particular, has potential therapeutic capabilities; it reduces free radicals while mending damage to the skin's proteins and lipids. This oil has anti-aging qualities and may also help with skin discoloration. Ylang-ylang oil has also been used in India to treat headaches, ocular irritation, and gout.<sup>[25]</sup>

### Essential oil: Clary sage

The essential oils of *Salvia sclarea*, Lamiaceae, produced by hydro distillation of dried aerial portions. Clary sage essential oil is particularly efficient in preventing DNA and protein damage caused by free radicals, according to a research.<sup>[26]</sup> Free radicals are molecules that are thought to be involved for a variety of skin problems.<sup>[27]</sup> Furthermore, clary sage essential oil possesses astringent characteristics that help the skin age gracefully. It also has antimicrobial effects.<sup>[26]</sup>

### Essential oil: Sandalwood

It is obtained from heart wood of *Santalum album* family Santalaceae. The MAHD essential oil includes oxygenated terpenes (santalol, -santalol, and many more) in high concentrations. The principal oxygenated terpenes in the essential oil derived from sandalwood were –santalol and -santalol, which were the most abundant oxygenated terpenes in the essential oils extracted from sandalwood (28.73% and 24.10%, respectively).<sup>[28]</sup> Due to its strong anti-inflammatory effects, sandalwood essential oil has become an indispensable skin care product in recent years.<sup>[29]</sup> As a result, it is often used in the

treatment of inflammatory skin conditions.<sup>[30]</sup> Sandalwood essential oil also has the ability to efficiently restore moisture to the skin. It has antimicrobial properties and may, therefore, be used to treat acne.<sup>[28]</sup>

### Essential oil: Pomegranate

It is obtained from seeds of *Punica granatum* family Lythraeae. -sitosterol was the most common sterol identified in the PGO, followed by campesterol and delta-5 avenasterol [Table 1]. Delta-7 stigmaterol, stigmaterol, brassicasterol, and campestanol, on the other hand, were only found in trace amounts.<sup>[31]</sup> It possesses antioxidant and anti-inflammatory qualities, resulting in smoother, healthier skin. Pomegranate essential oil protects the skin from free radicals and promotes new skin cell renewal thanks to its high antioxidant content. It also has a high amount of Vitamin C, which aids in the formation of collagen and, hence, enhances skin suppleness. Pomegranate oil, according to studies, may reduce oxidative stress and hence prevent wrinkle development on the skin [Figure 1].<sup>[32]</sup>

**Table 1: Essential oils and their pharmacological actions**

Sr. No.	Essential oil	Pharmacological activity	References
1	Rose hip seed oil	Antiseptic, disinfectant, coolant, perfume, Antimicrobial, Relaxant, Antioxidant, Analgesic, and anti-inflammatory	[1-4]
2	Carrot seed oil	Antioxidant, skin toner, and anti-inflammatory,	[5,6]
3	Frankincense essential oil	Anti-inflammatory, antibacterial, astringent, and skin toner	[8,9]
4	Geranium essential oil	Manage acne, blemishes, Dry skin, aging skin, eczema, heal Bruises, burns, cuts, broken capillaries, ringworm, etc.	[7,10,11]
5	Lavender	In aromatherapy, relaxant, strong anti-inflammatory, antioxidants, enhances blood circulation on skin	[12-14]
6	Neroli	Antioxidant, anti-inflammatory healing stretch marks antibacterial enhance skin elasticity, and treat blemish-prone skin fungal infections such as athlete's foot and jock itch may be healed	[7,15]
7	Myrrh	Antioxidant, improve skin tone, improve skin elasticity, antifungal, manage ringworm, and athlete's foot	[16,17]
8	Tea Tree	Anti-inflammatory, anti-fungal and anti-viral, and anti-bacterial properties	[18,19]
9	Rose	Antimicrobial, anti-inflammatory, psoriasis and dermatitis, stimulates blood circulation, and collagen synthesis of the skin	[19-21]
10	Patchouli	Anti-inflammatory, protective effects toward harmful radiation	[22,23]
11	Ylang-Ylang	Antioxidant, improve skin elasticity, anti-ageing	[24,25]
12	Clary Sage	Antioxidant and antimicrobial	[26,27]
13	Sandalwood	anti-inflammatory, astringent, and skin toner	[28-30]
14	Pomegranate	Antioxidant, reduce photo aging hence prevents wrinkle formation	[31,32]
15	Turmeric	Antimicrobial and antioxidant psoriasis, eczema, hyperpigmentation, and anti-allergic	[33,34]
16	Neem	Antioxidants, acne, psoriasis, in eczema, and antibacterial	[33,35-40]

### Essential oil: Turmeric

It is obtained from roots and rhizomes of *Curcuma longa* family Zingiberaceae. The principal ingredients are ar-turmerone, -turmerone, and -turmerone, with significant quantities of -zingiberene, curlone, ar-curcumene, -santalene, santalenone, -sesquiphellandrene, (Z)—ocimene, -bisabolene, -caryophyllene, -phellandrene, (Z)—farnesen (Z)-atlantone, ar-turmerone, and (E)-atlantone were found in Brazilian samples.<sup>[33]</sup> A combination of -bisabolene, (E)—ocimene, -myrcene, 1,8-cineole, -thujene, -phellandrene, limonene, zingiberene, and -sesquiphellandrene was found in a sample from north-central Nigeria.<sup>[33]</sup> Turmeric essential oil is a well-known skin rejuvenator that may assist to renew skin and prevent the appearance of wrinkles.<sup>[34]</sup> Cur cumin is the major active component in turmeric essential oil, and it includes anti-inflammatory enzymes that may help fight cell formation and relieve itchy skin spots. This essential oil is also effective in reducing black spots on the skin and hence aids in skin brightening. According to a research, turmeric oil used in lotion formulation may brighten skin in 3 weeks with benefits that last the same amount of time.<sup>[7]</sup> According to study, both topical and oral cur cumin may relieve plaque psoriasis symptoms in 9–12 weeks.<sup>[34]</sup>

### Essential oil: Neem

The fruits and seeds of the neem tree *Azadirachta indica*, which belongs to the Malvaceae family, are used to make neem oil. Nimbin, nimbanene, 6-desacetylnimbinene, nimbandiol, nimbolide, ascorbic acid, n-hexacosanol, amino acid, 7-desacetyl-7-benzoylgedunin, 17-hydroxyazadiradione, and nimbiol are some of the chemical elements found in neem leaves. When applied to the skin, it has a variety of advantages.<sup>[35]</sup> Neem oil includes variety of fatty acids which are useful for skin due to presence of fatty acids and anti-oxidants.<sup>[36]</sup> The fatty acids palmitic, linoleic, and oleic acids contained in neem essential oil promote healthy, supple skin.<sup>[37]</sup> As a result, it is a widely used component in skin care products. According to research, neem oil has medical applications in treating a number of skin illnesses such as acne, psoriasis, and eczema.<sup>[33]</sup> It also possesses anti-aging properties and aids in the treatment of skin ageing signs such as wrinkles, skin thickness, and redness.<sup>[38-40]</sup>

### Essential Oil: Magical Medicine for Skin Diseases?

Essential oils have high concentration of anti-oxidant, anti-inflammatory, anti-microbial, antiviral, and compositions. Furthermore, they have large scale of vitamin content such as Vitamin A, D, C, and E and all these composition makes them a useful remedy for skin diseases and also in cosmetics. Some research studies says that essential oils has efficiency to treat skin diseases like eczema, psoriasis, vitiligo, melasma.

### Eczema

A skin ailment results in itchy, dry, and red rashes. Atopic dermatitis is the most frequent kind. Essential oils such as chamomile, clove, geranium possessing high anti-inflammatory, and anti-oxidant action help to cure this skin irritation and retain moisture in skin.<sup>[41]</sup>

### Psoriasis

Plaques, itchy or painful regions of thick, dry, and discolored skin are caused by psoriasis, an inflammatory disease. Psoriasis plaques may appear everywhere on the body, although they most often appear on the elbows, knees, scalp, back, face, palms, and feet. Essential oils of geranium, myrrh, boswellia, ylang-ylang, lavender, neem, sandalwood, etc., can aid in management of this skin infections.<sup>[42]</sup>

### Vitiligo

Skin coloration or pigmentation occurs as a result of pigment-producing cells in the body. Melanin is the color pigment of the skin. When these cells die and are not replaced, or they stop functioning, Vitiligo occurs. No evidence found for complete cure of vitiligo by essential oils but some of the oils help to avoid symptoms in better way, for example, chamomile oil, geranium oil, and sandalwood.<sup>[43]</sup>

### Melasma

It is characterized by uneven, muddy-looking areas on the face, particularly over the top lip and forehead. Tea tree, Lavender, Frankincense, Eucalyptus, and Myrrh essential oils, as well as Pomegranate oil, have antibacterial characteristics that help cleanse and protect the skin against infections and Melasma assaults.<sup>[44]</sup>

Moreover, many more skin diseases *Verruca vulgaris*, *Molluscum contagiosum*, oral mucositis, genital warts, dermatitis, and acne and some skin problems such as striae, dullness, dark spots, blackheads, and blemishes can be dealt with use of one or combination of essential oils discussed in this study.<sup>[45,46]</sup>

### Conclusion

We can conclude that essential oils of rosehip seed, carrot seed, frankincense, geranium, lavender, neroli, myrrh, tea tree, rose, patchouli, ylang-ylang, clary sage, sandal wood, pomegranate, turmeric, and neem help in many ways with little or no side effects which maintains the physiological and psychological betterment for the life. As discussed in above study essential oils have antimicrobial, antioxidant and anti-inflammatory activity which suggest that they may be useful in skin problems such as acne, pigmentation, UV protection, dull and dark skin, eczema, psoriasis, melisma, and vitiligo.

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