RCMOS – Multidisciplinary Scientific Journal of Knowledge.
ISSN: 2675-9128. Sao Paulo-SP.

**Year V, v.1, n.1, Jan/July 2025. | submission: 2025-05-10 | accepted: 2025-05-12 | publication: 2025-05-14**

# Use of essential oils in the treatment of acne

*Use of essential oils in the treatment of acne*

Laura Athanassakis Jordan – Senac University Center
Maria Carolina de Paula Aguiar – Senac University Center
Victoria Jorge Franciscon – Senac University Center
Felipe Scholz Ramos – Senac University Center
Marcia Freire dos Reis Gorny – Senac University Center

**SUMMARY**

Acne vulgaris is a chronic inflammatory condition that affects the pilosebaceous follicles, and is common in adolescence but also persistent in adults. In addition to the physical impacts, it can compromise the psychological well-being and self-esteem of affected individuals. Although conventional treatments have proven efficacy, they are often associated with undesirable side effects, which has driven interest in natural and less aggressive approaches, such as the use of essential oils. This integrative review aimed to analyze the efficacy of these compounds in the treatment of acne, bringing together studies that evaluated different formulations and methods of topical application. The data obtained demonstrated antimicrobial, anti-inflammatory, sebum-regulating and regenerative properties associated with essential oils, which contributed significantly to the reduction of acne lesions, improvement of skin texture and control of oiliness. Despite the observed benefits, the reported adverse effects, such as irritation and sensitivity, reinforce the importance of safe application guided by trained professionals. It is therefore concluded that essential oils represent a promising alternative in the management of acne, with the potential to integrate aesthetic and therapeutic protocols, as long as they are used in a conscious, individualized manner and supported by evidence.

**Keywords:** Acne vulgaris; essential oils; natural treatment; aromatherapy

**ABSTRACT**

Acne vulgaris is a chronic inflammatory condition that affects the pilosebaceous follicles, and is common in adolescence but also persistent in adults. In addition to the physical impacts, it can compromise the psychological well-being and self-esteem of affected individuals. Although conventional treatments have proven efficacy, they are often associated with undesirable side effects, which has driven interest in natural and less aggressive approaches, such as the use of essential oils.
This integrative review aimed to analyze the efficacy of these compounds in the treatment of acne, bringing together studies that evaluated different formulations and methods of topical application.
The data obtained demonstrated antimicrobial, anti-inflammatory, sebum-regulating and regenerative properties associated with essential oils, which contributed significantly to the reduction of acne lesions, improvement of skin texture and control of oiliness. Despite the observed benefits, the reported adverse effects, such as irritation and sensitivity, reinforce the importance of safe application guided by trained professionals. It is therefore concluded that essential oils represent a promising alternative in the management of acne, with the potential to integrate aesthetic and therapeutic protocols, as long as they are used in a conscious, individualized manner and supported by evidence.

**Keywords:** Acne vulgaris; essential oils; natural treatment; aromatherapy

## 1. INTRODUCTION

Acne vulgaris is one of the most common skin conditions, affecting between 35% and 90% of people. adolescents, with an incidence of 79% to 95% among Western adolescents. Although acne is often associated with puberty, it can persist or emerge into adulthood, especially in women. (Silva, 2020). The condition is characterized by chronic inflammation of the pilosebaceous, resulting in lesions such as comedones, papules, pustules and, in more severe cases, nodules and cysts. (Costa, 2023)

Conventional treatments for acne include topical and oral antibiotics, retinoids, and hormone therapies. However, these treatments can have significant side effects. (Kutulu, 2023). In this context, essential oils have emerged as a promising alternative due to its anti-inflammatory, antibacterial and antioxidant properties. (Rodrigues, 2024)

Essential oils, such as tea tree oil *(Melaleuca Alternifolia (Tea Tree) Leaf Oil),* lavender *(Lavandula Angustifolia (Lavender) Oil)* and rosemary *(Rosmarinus Officinalis (Rosemary) Leaf Oil),* have been shown to be effective in reducing inflammation and inhibiting the growth of bacteria acne-causing bacteria, such as *Cutibacterium acnes.* Additionally, these oils can help regulate sebum production and promote skin healing. Studies indicate that topical use of oils essential oils may be a safe and effective approach to acne management, with fewer side effects side effects compared to conventional treatments. (Chaves, 2022)

Therefore, this integrative review aims to analyze the effectiveness of oils essential in the treatment of acne.

## 2 THEORETICAL FRAMEWORK

### 2.1 TEGUMENTARY SYSTEM

The integumentary system is composed of the skin and its appendages (hair, nails, sweat glands and sebaceous glands). The main function of the skin is understood to be delimitation, which brings as resulting in the protection of internal structures against the external environment. In addition, the functions of skin thermal control, absorption and secretion of liquids, maintenance of its own integrity and the body, among others. The skin is divided into three main layers, the epidermis being the

outermost, the dermis as connective tissue and the hypodermis the deepest layer that has as main characteristic is the presence of fat cells. (Nascimento-Júnior, 2020)

### 2.1.1 LAYERS OF THE SKIN

The epidermis corresponds to the layer that has the greatest contact with the external environment, being the thus the most superficial. Characterized by being made up of five layers (basal, spinous, granular, lucid and horny), the epidermis has a system of constant cell renewal, that is, in the basal layer the epidermal cells originate, and undergo changes in their shape and composition until they migrate to the stratum corneum, already anucleated, where the desquamation of the skin. (Leonardi, 2022)

The dermis is the middle layer. It contains blood vessels, nerves, a greater diversity of cells such as fibroblasts and macrophages, as well as the skin's appendages. It is divided into the dermis papillary, the layer closest to the epidermis that is responsible for attaching the basement membrane to the network of elastin fibers in the dermis, and reticular dermis which has a greater density and has the function to ensure skin strength and elasticity. (Albano, 2018)

The hypodermis refers to the deepest layer of the skin, also called the dermis. subcutaneous, is made up of two main cells, fibroblasts and adipocytes. It has the following main functions: storage of energy reserves, formation of a thermal blanket responsible for the body's thermoregulation, protection against physical shocks, as well as connecting the dermis adjacent structures such as muscle and bones. (Bernardo, 2019)

### 2.1.2 SKIN APPENDICES

Skin appendages correspond to hairs that are found almost all over the body with except for the palms of the hands and soles of the feet, nails are found on the tips of the fingers and feet, sweat glands divided into eccrine which are found throughout the body and contribute to thermoregulation and apocrines found mainly in the armpits and region perianal, and sebaceous glands found associated with hair follicles and have as a product the tallow. (Pawlina, 2021)

## 2.2 ACNE

Considered a dermatosis, acne is a chronic inflammatory condition that affects the pilosebaceous follicles, leading to inflammation and formation of lesions such as papules, pustules, comedones, nodules and cysts that can generate irreversible scars. (Santos, 2020)

### 2.2.1 ETIOPATHOGENESIS OF ACNE

The pathophysiology of acne vulgaris is complex and involves multiple factors that interact with each other. si. The etiopathogenic mechanisms include sebum hyperproduction that is associated with a excessive production of sebum by the sebaceous glands, stimulated by androgenic hormones, which increase the activity of these glands, especially during puberty. Hyperkeratinization follicular which refers to the increased production of keratin in the skin cells that line the hair follicles, leading to the accumulation of dead cells on the surface of the follicle, resulting in obstruction and formation of comedones. Bacterial colonization by the bacterium *Cutibacterium acnes* identified as a commensal microorganism that becomes pathogenic under conditions of obstruction follicular. The proliferation of this bacteria inside the obstructed follicles contributes to the inflammation and the formation of acne lesions. Finally, inflammation, which is a central component in pathophysiology of acne. Obstruction of follicles, together with bacterial colonization, results in in the release of inflammatory mediators that cause redness, swelling and pain in acne lesions. The inflammatory response varies resulting in different degrees of acne, from mild to severe forms. more serious, such as acne conglobata. (Silva, 2023)

### 2.2.2 CAUSAL AND AGGRAVATING FACTORS

Acne can be triggered or worsened by a number of factors such as diet, health disorders, hormonal changes, use of medications, cosmetics, among others. The consumption of fatty foods, dairy and refined sugar may be linked to acne in adults today. Additionally, when Adult acne appears abruptly, it is important to observe possible symptoms of hormonal changes such as hyperandrogenism, which requires clinical attention. The erroneous use of cosmetics has been a relevant factor in the emergence of acne in adult women and adolescents. Normally

These cosmetics contain lanolin, isopropyl myristate, cetyl alcohol and stearic acid, which are comedogenic substances. (Kutulu, 2023)

### 2.2.3 DEGREES OF ACNE

Based on the variety of lesions, the type and severity of acne is determined. For present a wide range of clinical manifestations, its classification is not standardized, however, there is literature that describes the classification of acne in degrees, ranging from I to V. The degree I consists of closed and open comedones, and with little or no inflammatory lesions such as papules. Grade II, also called inflammatory papulopustular acne, presents comedones open and closed, papules and pustules. Grade III, or inflammatory nodulocystic acne, manifests open and closed comedones, papules, pustules, cysts and nodules. Grade IV, or acne conglobata, considered rare, it presents deep, purulent abscesses that connect, which contributes to the formation of scars and deformations in the skin tissues. The emergence of acne conglobata has relationship with the worsening of less severe degrees of acne. Finally, grade V, also known like acne fulminans, considered extremely rare, the bacteria *Cutibacterium acnes* begins to act as a superantigen, leading to an exaggerated and dysregulated immune response, having as result in worrying inflammatory symptoms. It consists of the formation of nodules and abscesses that can progress to necrosis and generate disorganized healing. (Campos, 2019)

### 2.2.4 HEALING

Acne scarring is related to the inflammatory process, therefore, the type of scar will depend on the severity of the inflammation. The acne healing stage occurs according to the biological process of skin recovery after an injury, manifesting fibrous tissue that replaces the injured tissue. The scar is the result of tissue loss or increase, and is classified into atrophic scar when there is a decrease in collagen and deep dermal involvement, and scar hypertrophic when there is a minimization of collagenase and excess collagen. It becomes more effective the prevention of scars during correct treatment in the inflammatory phase of acne, in relation to treatments for already formed scars. (Lima, 2020)

In addition to scarring, acne can cause changes in skin pigmentation, such as post-inflammatory hyperpigmentation. This condition occurs when inflammation causes the release of

of chemical mediators, which increase vascular permeability and attract more cells inflammatory responses to the affected area. This intense inflammatory response can lead to damage to the melanocytes, which are the cells responsible for producing melanin. Inflammation activates these melanocytes, resulting in excessive production of melanin. This excess is an attempt by the body to protect the damaged skin, but results in dark spots on the affected area after resolution of inflammation. In addition, hyperpigmentation is more pronounced in individuals with higher concentration of melanin in the skin, such as those with higher phototypes. Another aspect important to consider are the psychological effects of acne. Studies show that people with acne, especially those with more severe forms, can face low self-esteem, anxiety and depression. Skin appearance can affect self-image and social interaction, leading to increased stigma and social isolation. (Costa, 2011)

## 2.3 ESSENTIAL OILS

Essential oils are volatile compounds extracted from aromatic plants and are used for millennia in various cultures for medicinal, cosmetic and religious purposes. The origin of these oils dates back to the ancient Egyptian, Greek and Roman civilizations, where they were used in rituals and health treatments. Nowadays, the extraction of essential oils involves modern techniques that guarantee the purity and effectiveness of the compounds. (Bizzo, 2009)

### 2.3.1 WORLD OVERVIEW

According to Bizzo (2022), the global market for essential oils, driven by a growing demand in industries such as food, cosmetics, pharmaceuticals and aromatherapy, has experienced significant growth in recent years. In 2021, the global market for essential oils was valued at US$10.3 billion, representing 253 thousand tons, with a expectation of continued growth. The projection is that it will reach US$ 16 billion per year and 345 thousand tons by 2026. However, these figures encompass all products classified under heading 3301 of the Harmonized System (a system of codes used in international trade to identify and classify goods in a standardized way), which includes extracts, resinoids and other materials aromatic.

### 2.3.2 ACTION OF ESSENTIAL OILS ON ACNE

The action of essential oils is related to their ability to interact with processes physiological and microbiological aspects of the skin, promoting important therapeutic effects. In the context of acne vulgaris, which is one of the most prevalent dermatological conditions, these oils have been called attention as complementary and natural treatment options. (Gentil, 2019)

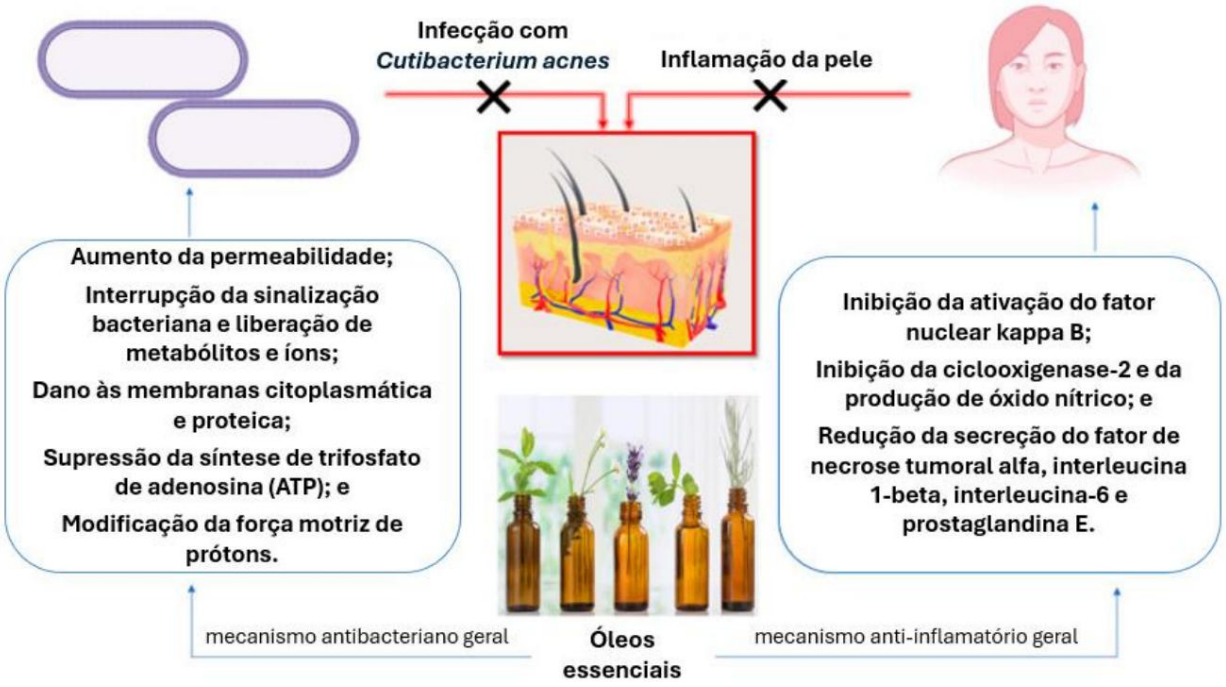


Figure 1 – Mechanisms of action of essential oils in combating acne. Source: Bungau et al. (2023) Adapted and translated. Available at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC10489792/#molecules-28-06395-f001>. Access in: May. 2025.

RCMOS - Multidisciplinary Scientific Journal of Knowledge.
ISSN: 2675-9128. Sao Paulo-SP.

### 2.3.3 ESSENTIAL OILS IN HYPERKERATINIZATION

Hyperkeratinization is characterized by excessive production of keratin, which can lead to thickening of the stratum corneum and obstruction of pores. Some essential oils have been shown to effective as adjuvants in the normalization of this process, due to their anti-inflammatory, regenerative and modulatory of cell differentiation. Although there are still few consolidated scientific evidence, *in vitro* research indicates that certain essential oils can directly or indirectly influence cell renewal. Among them, essential oil Rose *Absolute Oil* has been shown to stimulate the expression of proteins such as involucrin and filaggrin, essential for the differentiation of keratinocytes and the recovery of barrier function skin, in addition to reducing excessive cell proliferation. (Kim, 2010) *Erigeron* essential oil *annuus* showed significant effects on the proliferation and migration of keratinocytes, favoring the skin regeneration and contributing to improving its texture. These findings suggest a potential therapeutic use of these oils as allies in the care of skin with changes in epidermal renewal. (Kim, 2018)

### 2.3.4 ESSENTIAL OILS IN SEBACEOUS HYPERACTIVITY

Excessive production of sebum by the sebaceous glands, known as hyperactivity sebaceous, is one of the main characteristics of oily skin and is often related to emergence of acne. In view of this, some essential oils have been explored as allies in be careful with this skin type. An *in vivo* study conducted with Korean women showed that Myrtle essential oil *(Myrtus communis),* when applied topically, was able to reduce significantly the production of sebum, the presence of dilated pores, erythema and the amount of microorganisms associated with acne. In addition, it presented astringent, antibacterial and sebum-regulating, promoting a general improvement in the appearance of acne-prone skin safely and without cause irritation. (Kim, 2018)

### 2.3.5 ESSENTIAL OILS IN BACTERIAL PROLIFERATION



Bacterial proliferation, especially *Cutibacterium acnes,* is a key factor in development of acne. Tea tree essential oil *(Melaleuca alternifolia)* due to its

bactericidal action, that is, it inhibits bacterial growth, can reduce the risk of inflammation, and prevent possible skin problems related to bacterial proliferation. (Baccoli, 2015)

### 2.3.6 ESSENTIAL OILS IN INFLAMMATION

Skin inflammation is a common response of the body to various conditions, such as acne, dermatitis and allergic reactions. In this context, some essential oils have been shown to anti-inflammatory and calming potential, which can help relieve irritation and regenerate skin. Among them, lavender essential oil *(Lavandula Angustifolia),* often used in cosmetic formulations to reduce redness and provide a feeling of skin comfort. (Barreto, 2022)

## 3. MATERIAL AND METHOD

This research is characterized as an integrative review that allows the incorporation of a wide range of studies with different methodological approaches, with the aim of comprehensively understand a given topic, and of a qualitative nature, that is, focused on critical and interpretative analysis of the selected studies. The inclusion criteria are studies published in the last 10 years, to ensure up-to-date data; articles in Portuguese and English, facilitating understanding and analysis; studies that address the use of specific essential oils in acne treatment; research that includes information on mechanisms of action, effects bactericidal and anti-inflammatory properties of essential oils. And as exclusion criteria are studies that address essential oils for dermatological conditions other than acne; publications that do not address the side effects of traditional treatments or the direct effect of essential oils on acne.

Searches were carried out in scientific databases, such as PubMed, Scielo and Google Academic, in addition to physical and virtual libraries, in Portuguese, English and Spanish, using terms related to the topic, such as "essential oils", "acne" and "acne treatment". (Rodrigues, 2022)

## 4. RESULTS AND DISCUSSION

According to Rocha (2024), acne, in addition to affecting the skin, directly influences the self-esteem, emotional well-being and even the social relationships of those who live with it. Therefore, seeking effective and less aggressive alternatives for its treatment is a real need, especially for those who experience side effects or limitations with conventional therapies. In this section, the main findings on the use of essential oils as allies will be presented and discussed promising in acne care. The results gathered point to more natural approaches, and respectful of the skin's needs.

Table 1 summarizes the methodological aspects and main results found in the materials that explicitly refer to the use of essential oils in the treatment of acne.

**Table 1: Summary of methodological aspects and results**

| Authors | Year | Methodology | Results |
|---|---|---|---|
| Kozlowska, J.; Kaczmarkiewicz, A.; Stachowiak, N.; Sionkowska, A. | 2017 | The study was carried out with six adults, three female and three male. They were tested five tonics containing 0.25% juniper berry oil *(Juniperus communis),* 0.25% geranium oil *(Pelargonium graveolens)* , or 1% niacinamide. This was a short-term study, with a total evaluation time of two hours. | Both geranium *(Pelargonium graveolens)* and juniper *(Juniperus communis)* essential oils demonstrated sebostatic activity at 10 and 60 minutes after application. However, geranium *(Pelargonium graveolens)* essential oil maintained the inhibition of sebaceous gland activity for a longer period, being effective up to 2 hours after application. |
| Kim, KY; Jang, HH; Lee, S.N | 2018 | Twenty Korean women with facial acne were selected. Of these, ten were assigned to the experimental group and ten to the control group, and they were statistically equal. The test lasted six weeks. A foam cleanser, toner, emulsion and cream were used, all containing myrtle essential oil *(Myrtus communis)* in their composition. | After the treatment period, it was observed that the experimental group treated with myrtle oil showed a reduction in the degree of acne in 80% of the individuals. In relation to prominent pores, comedones, sebum production, scaling and microorganism index, a decrease was also observed in this group. |
| Mazzarello, V.; Gavini, E.; Rassu, G.; Donadu, MG; Usai, D.; Piu, G.; Pomponi, V.; Sucato, F.; Zanetti, S.; Montesu, MA | 2020 | The study included men and women aged 18 to 34 years, in good health, without active diseases and without recent use (in the last three months) of topical or systemic skin treatments. All had mild to moderate facial acne. A total of 60 volunteers were selected and randomly distributed into two groups of 30 people each. Group A used a cream formulation containing 3.74% myrtle essential oil *(Myrtus communis* L.), 0.1% oregano essential oil *(Origanum vulgare)* and 0.025% tretinoin (MOTC formulation). Group B, which acted as a positive control, applied a commercial dermatological gel containing 1% clindamycin and 0.025% tretinoin (Acnatac®, Meda Pharma GmbH, Germany) daily. The protocol lasted four weeks. | : Both treatments affected the skin barrier, which has been observed in previous studies, due to the presence of tretinoin. The initial improvement in erythematous lesions may be related to the anti-inflammatory capacity of oregano oil against bacteria associated with acne. In summary, myrtle and oregano essential oils showed antimicrobial and anti-inflammatory efficacy, being useful in reducing lesions acne and erythema caused by retinoids. Thus, these oils may represent a natural alternative to the use of antibiotics in formulas with retinoids. |
| Infante, VHP; Darvin, ME; Campos, PMBGM | 2023 | Fifty-three male participants, aged 18 to 28 years, diagnosed with non-inflammatory acne were selected. The study evaluated four cosmetic formulations: a placebo formulation (base vehicle without essential oils); a formulation containing a mixture of four essential oils in equal parts, totaling 2%, composed of *Melaleuca alternifolia* (tea tree – 41% terpinen-4-ol), *Lavandula angustifolia* (lavender – 34% linalool), *Eucalyptus globulus* (eucalyptus – 83% 1,8-cineole) and *Citrus reticulata* (tangerine – 86% d-limonene); a formulation with 2% pure tea tree essential oil; and a formulation with 2% previously characterized tea tree nanoemulsion. Treatment was performed for 90 consecutive days. | The study demonstrated that tea tree oil nanoemulsion was the most stable and effective formulation in the treatment of non-inflammatory acne, due to its lower volatility and better release of active ingredients. Raman spectroscopy analysis confirmed the presence of the main active terpenes in the essential oils used (such as terpinen-4-ol, d-limonene, linalool and 1,8-cineole). The oil mixture showed synergy between compounds, and RCM images indicated a reduction in comedone formation. These results reinforce the cosmetic potential of essential oils, especially in formulations with delivery systems such as nanoemulsions. |

Several studies have analyzed the effectiveness of different essential oils in treating acne, both in its inflammatory and non-inflammatory form, using different experimental models, compositions and forms of application. In all, a consistent response trend is observed positive to the use of these natural compounds.

The oldest study among those analyzed, carried out by Kozlowska et al. (2017), investigated the sebostatic effects of geranium *(Pelargonium graveolens)* and juniper essential oils *(Juniperus communis),* comparing them to a formulation with 1% niacinamide. The sample was small, consisting of only six adults (three men and three women), and the total evaluation time was only two hours. Still, the results were relevant to understanding the action immediate release of these compounds. It was observed that both geranium and juniper oil showed inhibition of sebaceous gland activity at 10 and 60 minutes after application. The geranium oil stood out for maintaining this inhibition for up to two hours, demonstrating an effect longer lasting sebostatic effect. These data, although preliminary, suggest that geranium oil may play an important role in controlling the oiliness of acne-prone skin.

Next, Kim et al. (2018) investigated the effects of myrtle essential oil *(Myrtus communis)* in twenty Korean women with facial acne, divided equally between group experimental and control group. For six weeks, participants in the experimental group used cosmetic products (foam cleanser, toner, emulsion and cream) containing oil myrtle. The results showed that 80% of the volunteers showed a significant reduction in degree of acne. There was also a decrease in the presence of prominent pores, comedones, production sebum, scaling and microorganism index. These findings show that myrtle oil acts in a multifunctional way, promoting not only anti-acne action, but also balancing the Skin microbiota and oil control — essential factors for sustained skin improvement acneic.

In 2020, Mazzarello et al. conducted a study with 60 healthy volunteers, aged between 18 and 34 years old, diagnosed with mild to moderate facial acne. Participants were divided randomly divided into two groups of 30 people. Group A used a cream formulation containing myrtle essential oil (3.74%), oregano essential oil (0.1%) and tretinoin (0.025%). Group B, positive control, used a commercial dermatological gel containing clindamycin (1%) and tretinoin (0.025%). Both treatments promoted changes in the skin barrier, probably due to the action of tretinoin. However, the group that used the formulation with oils essential showed significant improvement in lesions with erythema, a result that may be

related to the anti-inflammatory action of oregano oil, known for its effectiveness against bacteria related to acne. Thus, the study suggests that the association of essential oils with retinoids can offer a natural and effective alternative to the use of topical antibiotics, contributing to minimize the risks of bacterial resistance.

More recently, the study by Infante, Darvin and Campos (2023) brought an approach robust and technological when evaluating the effects of different cosmetic formulations in the treatment of non-inflammatory acne in 53 men aged 18 to 28 years. Four formulations were tested over 90 consecutive days: a placebo (base vehicle), a mixture of four oils essentials *(Melaleuca alternifolia, Lavandula angustifolia, Eucalyptus globulus* and *Citrus reticulata)* in equal parts totaling 2%, a formulation with 2% pure tea tree essential oil, and one with 2% tea tree nanoemulsion. The results revealed that the nanoemulsion was the most effective, presenting better stability and capacity to release assets due to its smaller size volatility. Raman spectroscopy analysis confirmed the presence of the main terpenes in the oils used, such as terpinen-4-ol, d-limonene, linalool and 1,8-cineole. The synergistic action between the compounds was visible, especially in the combined formulations. Confocal microscopy images by reflectance (RCM) indicated a reduction in the formation of comedones, reinforcing the efficacy therapeutics of essential oils, especially when used in delivery systems advanced as nanoemulsions.

On the other hand, it is necessary to consider that, although these oils offer evident benefits, its use may not be risk-free. Silva (2019) points out that, in the case of tea tree oil, reactions such as irritation, redness and itching may occur, especially when used in high concentrations or without dilution. This also applies to geranium oil, which, according to Oliveira (2019), can cause mild burning or even contact dermatitis in more sensitive skin, especially with prolonged use. These adverse effects reinforce the need for formulations well-designed, with safe dosages compatible with the user's skin type.

In summary, the studies analyzed show that essential oils have great potential therapeutic in combating acne, acting on different fronts such as sebum regulation, action antimicrobial, anti-inflammatory and healing. However, it is essential to pay attention to the concentrations used, the skin type and the method of application, to ensure effectiveness and safety in the treatment. As Benetti (2022) highlights, the use of these natural compounds represents a viable and effective in the conventional treatment of acne, contributing not only to the improvement of lesions, but also for the health and balance of the skin as a whole.

## FINAL CONSIDERATIONS

Based on the studies analyzed, it is concluded that essential oils have demonstrated potential therapeutic in the treatment of acne, and can be considered as natural alternatives or complementary to conventional methods. Its antimicrobial, sebum-regulating properties, anti-inflammatory and regenerative properties contribute to the improvement of acne lesions, in addition to promote overall skin health.

The reviewed research shows significant clinical improvements through the application topical application of formulations containing essential oils, with observed reductions in sebum production, inflammation, in the presence of microorganisms and in the texture of the skin.

However, it is essential to highlight that inappropriate use, especially in concentrations high or without appropriate dilution, can cause adverse effects. Therefore, the application should be carried out with caution, under the guidance of professionals, considering individual characteristics of each skin.

Therefore, although essential oils have relevant benefits in acne care, Additional clinical studies are still needed, with larger samples and standardized protocols, in order to consolidate its efficacy and safety in different degrees of dysfunction and expand its use in aesthetic and therapeutic dermatology.

## REFERENCES

ALBANO, RPS; PEREIRA, LP; ASSIS, IB Microneedling – the therapy that induces collagen production: a literature review. Saúde em Foco Journal, São Lourenço, issue no. 10, p. 455–473, https://portal.unisepe.com.br/unifia/wp-content/uploads/sites/10001/2019/07/058_MICROAGULHAMENTO_A_TERAPIA_QUE_INDUZ_A_PRODU%C3%87%C3%83O.pdf. Accessed on: September 10, 2024.

BACCOLI, BC; REIS, DA dos; SCIANI, MD; et al. The benefits of tea tree oil in grade II and III acne: a literature review. *UNINCOR Journal,* [Sl], v. 13, 2015. Available at: http://periodicos.unincor.br/index.php/revistaunincor/article/view/2008. Accessed on: April 12, 2025.

BARRETO, MF; ARAÚJO, DC de M.; MELLO, JCP de; et al. The potential use of essential oils in the treatment of acne: a literature review. *Conjecturas,* v. 22, n. 7, p. 472–494,

2022. DOI: 10.53660/CONJ-S34-1164. Available in: https://www.researchgate.net/publication/362435634_O_potencial_uso_de_oleos_essenciais_no_tra acne_treatment_a_literature_review. Accessed on: April 11, 2025.

BENETTI, IB; TEZÃO, PE; APARECIDA, J. Synergy of rosemary, geranium and calendula essential oils in the treatment of grade III acne: literature review. *Scientific Journal of FHO|Uniararas,* Araras, v. 10, n. 1, p. 1–10, Jan./Jun. 2021. Available at: https://ojs.fho.edu.br:8481/revfho/article/download/169/159/310. Accessed on: April 20, 2025

BERNARDO, AFC; SANTOS, K.; SILVA, DP Skin: anatomical and physiological changes from birth to maturity. Saúde em Foco Journal, issue 11, p. 1221–1233, 2019. Available at: https://portal.unisepe.com.br/unifia/wp-content/uploads/sites/10001/2019/11/PELE-ALTERA%C3%87%C3%95ES-ANAT%C3%94MICAS-E-FISIOL%C3%93GICAS-DO-NASCIMENTO-%C3%80-MATURIDADE.pdf. Accessed on: September 20, 2024.

BIZZO, HR; REZENDE, CM The essential oils market in Brazil and in the world in the last decade. *Química Nova,* São Paulo, v. 45, n. 8, p. 949–958, 2022. Available at: https://www.scielo.br/j/qn/a/6kPQ6NvhMW65Z4JNrtgYGph/. Accessed on: October 30, 2024.

BIZZO, Humberto R.; HOVELL, Ana Maria C.; REZENDE, Claudia M. Essential oils in Brazil: general aspects, development and perspectives. *Química Nova,* São Paulo, v. 32, n. 3, p. 588–594, 2009. Available at: https://doi.org/10.1590/S0100-40422009000300005. Accessed on: 30 October 2024.

BUNGAU, Alexa Florina; RADU, Andrei-Flavius; BUNGAU, Simona Gabriela; *et al.* Emerging Insights into the Applicability of Essential Oils in the Management of Acne Vulgaris. Molecules (Basel, Switzerland), v. 28, n. 17, p. 6395, 2023. (Figure 1) Available at: https://pubmed.ncbi.nlm.nih.gov/37687224/. Accessed on: May 8, 2025.

CHAVES, AKP; MENDES, FF; VALE, JKS; et. al. Efficacy of essential oils in acne treatment: an integrative literature review. FT Journal, v. 26, issue 116/NOV, 2022. Available at: https://revistaft.com.br/eficacia-dos-oleos-essenciais-no-tratamento-da-acne-uma-revisao-integrativa-da-literatura/. Accessed on: November 5, 2024.

GENTIL, CR; SOUZA, NEG; SOUZA, MPPF; ESSENTIAL OILS IN THE TREATMENT OF ACNE. Saúde em Foco Magazine, issue no. 11, p. 1175–1187, 2019. Available at: https://portal.unisepe.com.br/unifia/wp-content/uploads/sites/10001/2019/11/%C3%93LEOS-ESSENCIAIS-NO-TRATAMENTO-DE-ACNE.pdf. Accessed on: March 25, 2025.

GONELLI, T.; PILON, TPF; CHIARI-ANDRÉO, BG Tea tree oil for the treatment of acne: evidence from the literature. Brazilian Multidisciplinary Journal, v. 21, n. 3, p. 113–119, 2018. Available in: https://www.revistarebram.com/index.php/revistauniara/article/view/570#:~:text=Verified%2Dse%20than%20%C3%B3oil,%20most%20other%20treatments. Accessed: April 2, 2025.

INFANTE, VHP; DARVIN, ME; MAIA CAMPOS, PMBG Characterization and efficacy of essential oil-based cosmetic formulations for acne-prone skin. *Cosmetics,* Basel, v. 10, n. 6, p. 158, 2023. Available at: https://doi.org/10.3390/cosmetics10060158. Accessed on: May 5, 2025.

KIM, D.; WON, KJ; HWANG, D. Il; *et al.* Chemical Composition of Essential Oil from *Erigeron annuus* (L.) Pers. Flower and its Effect on Migration and Proliferation in Keratinocytes. Journal of Essential Oil Bearing Plants, vol. 21, no. 5, p. 1146–1154, 2018. Available at: https://www.tandfonline.com/doi/abs/10.1080/0972060X.2018.1526125. Accessed on: May 5, 2025.

KIM, J.; CHOI, D.; LEE, S.; *et al.* Enhancement of Keratinocyte Differentiation by Rose Absolute Oil. Annals of Dermatology, v. 22, p. 255, 2010. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC2917677/. Accessed on May 5, 2025.

Kim, K.; JANG, HH; LEE, SN; *et al.* Effects of the myrtle essential oil on the acne skin—clinical trials for Korean women. Biomedical Dermatology, vol. 2, no. 1, 2018. Available at: https://biomeddermatol.biomedcentral.com/articles/10.1186/s41702-018-0038-3. Accessed on: May 6, 2025.

KOZLOWSKA, J.; KACZMARKIEWICZ, A.; STACHOWIAK, N.; *et al.* Evaluation of Sebostatic Activity of Juniperus communis Fruit Oil and Pelargonium graveolens Oil Compared to Niacinamide.
Cosmetics, v. 4, n. 3, p. 36, 2017. Available at: https://www.mdpi.com/2079-9284/4/3/36. Accessed on: May 6, 2025.

KUTULU, Ö.; KARADAÿ, AS; WOLLINA, U. Adult acne versus adolescent acne:
narrative review focusing on epidemiology and treatment. Brazilian Annals of Dermatology, v. 1, n. 2, p.
98, n. 1, p. 75-83, 2023. Available at: https://clinics.elsevier.es/pt-acne-no-adulto-versus-acne-articulo-S2666275222002399.
Accessed on: October 10, 2024.

LEONARDI, GR Applied Cosmetology. 2nd Edition. São Paulo: MEDFARMA BOOKSTORE AND PUBLISHER, 2022.

MAZZARELLO, V.; GAVINI, E.; RASSU, G.; *et al.* Clinical Assessment of New Topical Cream Containing Two Essential Oils Combined with Tretinoin in the Treatment of Acne. Clinical, Cosmetic and Investigational Dermatology, vol. Volume 13, p. 233–239, 2020. Available at: https://pubmed.ncbi.nlm.nih.gov/32210603/. Accessed on: May 6, 2025.

NASCIMENTO-JUNIOR, BJ Basic systematic human anatomy. Petrolina,
Pernambuco:UNIVASF, 2020

OLIVEIRA, ACM; FONTANA, A.; NEGRINI, TC; et al. Use of Tea Tree Oil
alternifolia Cheel *(Myrtaceae)* in dentistry: perspectives on its use as an antimicrobial
alternative to infectious diseases of oral origin. Brazilian Journal of Medicinal Plants, v. 13,
n. 4, 492–499, 2011. Available at: in:
https://www.scielo.br/j/rbpm/a/3HdchzzsGnG9h8JV8pwjZym/abstract/?lang=pt. Accessed on: March 26, 2025.

OLIVEIRA, RKB; SARMENTO, AMMF. The use of geranium and juniper essential oils in facial rejuvenation. Diálogos em Saúde, v. 2, n. 1, 2019. Available at: https://periodicos.iesp.edu.br/dialogosemsaude/article/view/240. Accessed on: April 27, 2025.

OLIVEIRA, S.; PEDRIALI, MCA Development of an o/w emulsion associated with oil geranium essential oil *(Pelargonium graveolens)* and palmarosa essential oil *(Cymbopogon martinii).* Brazilian Journal of Natural Sciences, v. 2, n. 3, p. 127, 2019. Available at: https://bjns.com.br/index.php/BJNS/article/view/64. Accessed on: April 3, 2025.

PAWLINA, Wojciech et al. al. Ross Histology: Text and Atlas. 8th edition

ROCHA, M.; BARNES, F.; CALDERÓN, J.; *et al.* Challenges of acne treatment – Recommendations consensus of Latin American experts. Brazilian Annals of Dermatology (Portuguese), v. 99, 2024. Available at: https://clinics.elsevier.es/pt-desafios-do-tratamento-da-acne-articulo-S2666275224000237. Accessed on: April 29, 2025.

RODRIGUES, ASP; SACHINSKI, GP; MARTINS, PLO Contributions of the integrative review to qualitative research in Education. Critical Lines, Brasília, v. 28, e40627, Jan. 2022. Available at in: http://educa.fcc.org.br/scielo.php?script=sci_arttext&pid=S198104312022000100108&lng=pt&nrm=iso. Accessed on: October 5, 2024.

RODRIGUES, GS; Overview of natural products and their applications: a review. CPAQV Journal - Center for Advanced Research in Quality of Life, *[S. l.],* v. 16, n. 1, 2024. DOI: 10.36692/V16N1-152R. Available https://revista.cpaqv.org/index.php/CPAQV/article/view/2056. in: Accessed on: April 15, 2025.

SANTOS, AL; ARAUJO, MSR; SOUZA, RD; et al. Essential oil of *Melaleuca alternifolia* in the treatment of acne. Research, Society and Development, vol. 10, no. 15, p. e488101523108, 2021. Available at: https://rsdjournal.org/index.php/rsd/article/view/23108. Accessed on: April 15, 2025.

SANTOS, FF; SILVA, SV; LHAMAS, LMF Acne in focus: a bibliographic review of the main assets. Universitári@ - Scientific Journal of Unisalesiano - Lins, SP - Year 12 - No. 22, 2020. Available at: https://unisalesiano.com.br/lins/wp-content/uploads/2022/05/Article-28-corrected-aesthetics.pdf. Accessed on: October 10, 2024.

SILVA, LLS; LIMA, RMS; SOUSA, ER S; et al. Clinical use of oral antibiotics in treatment of acne vulgaris: Safety and therapeutic efficacy. Research, Society and Development, v. 15, n. 2, p. 12, 2023. Available in: https://www.researchgate.net/publication/375622617_Uso_clinico_de_antibioticos_orais_no_tratamento_da_acne_vulgaris_Safety_and_therapeutic_efficacy. Accessed on: September 11, 2024.

SILVA, LL; ALMEIDA, R.; VERÍCIMO, MA; et. al. Therapeutic activities of tea tree essential oil (melaleuca alternifolia) A literature review. Brazilian Journal of Health Review, *[S. l.],* v. 6, pp. 6011–6021, 2019. DOI: 10.34119/bjhrv2n6-094. Available at:

https://ojs.brazilianjournals.com.br/ojs/index.php/BJHR/article/view/5488. Accessed on: April 20, 2025.