A Systematic Review: Formulation of Facial Wash Containing Essential Oil

Cut Puspita Salsabila Syaharani¹, Nadia Isnaini¹,², Essy Harnelly²,³, Vicky Prajaputra³,⁴, Siti Maryam⁵, Fadli A. Gani⁶

¹Department of Pharmacy, Universitas Syiah Kuala, Banda Aceh 23111, Indonesia
²ARC-PUIPT Nilam Aceh, Universitas Syiah Kuala, Banda Aceh 23111, Indonesia
³Department of Biology, Universitas Syiah Kuala, Banda Aceh 23111, Indonesia
⁴Department of Marine Sciences, Universitas Syiah Kuala, Banda Aceh 23111, Indonesia
⁵Department of Family Welfare Vocational Education, Universitas Syiah Kuala, Banda Aceh 23111, Indonesia
⁶Department of Veterinary Education, Universitas Syiah Kuala, Banda Aceh 23111, Indonesia
⁷Research Center for Marine Sciences and Fisheries, Universitas Syiah Kuala, Banda Aceh 23111, Indonesia

*Corresponding author email address: nadiaisnaini@usk.ac.id

Abstract

Facial wash is a major need of the community because it is very helpful in removing dirt, dust, dead skin cells, oil, residual cosmetics and provides moisture to the skin. In general, the face wash used by the community is classified as a synthetic product that can damage the skin, one alternative to avoid this by using natural ingredients such as essential oils. Essential oils have many benefits, including as anti-acne, antibacterial, and antioxidant. The purpose of this literature review research is to find out the potential of essential oils and their formulations in facial wash through literature searches that can be a reference in future research. The systematic review method was carried out by collecting data from various literature sources obtained from several research journals that have been published both nationally and internationally accredited reviewing face wash containing essential oils. Based on the systematic review, it was found that there are several face wash formulations containing essential oils of patchouli oil, tea tree oil, jasmine oil, cinnamon oil, black cumin seed oil, basil oil, ylang-ylang oil, peppermint oil, turmeric oil, lemongrass oil, lavender oil, and tangerine oil.

Keywords: facial wash, essential oils, formulation, skin

1. INTRODUCTION

Hygiene is a very important thing to consider. Outdoor activities expose the skin to sunlight, bacteria, dust, and pollution that can cause skin problems so that the skin loses elasticity. The skin is the outermost part of the human body, the skin will always be exposed to the surrounding environment, ranging from exposure to sunlight, temperature, and air humidity. Dusty environments and excessive air pollution can make the skin dull and dirty. This will disrupt the skin's balance. Healthy facial skin is everyone’s dream, facial skin needs to be cared for to stay healthy. Facial skin care to keep it clean from dirt can be done by cleaning the facial skin. The face can be cleaned using clean milk or cleansing cream, washing solution or refresher, can also use facial wash. Cleaning the facial skin only with water without using soap becomes less clean and feels dirt is still attached because water cannot clean oil and dirt completely, so it takes some type of facial wash to clean the face from the dirt attached (Syahrana et al. 2022, Rohmani et al. 2022).

A washing agent is a whole set of facial wash that removes cosmetics, dead skin cells, oil, dirt, and various pollutants from the skin. Facial wash helps unclog pores and ward off skin problems such as skin inflammation (Bhavana et al. 2019). Facial wash commonly used by the public are classified as synthetic products that can damage the skin. Most facial products still use synthetic ingredients as active ingredients that have the potential to cause irritation to consumers who have sensitive skin and are harmful to the skin (Agarwal & Jindal, 2023). One alternative to avoid this is to use natural ingredients such as essential oils (Isnaini et al. 2022).

Essential oils are natural ingredients used in the cosmetic industry that have antimicrobial, antioxidant, anti-acne, anti-inflammatory, anti-aging, skin lightening, and sun protection properties. In recent years, essential oils have become a very popular ingredient for skincare. Many exploit essential oils in skincare by utilizing some of their biological properties to keep the skin youthful, healthy, and fresh and enable its protection from environmental damage. Essential oils have
lipophilic properties that can contribute to the maintenance of skin microbiota, which has a very important role in the maintenance of skin health, and the protective role of the stratum corneum (Kurniawan et al. 2020). Therefore, this literature review was conducted to find out the potential of essential oils and their formulations in facial wash through literature searches that can be a reference in further research.

1.1 Facial Wash

Facial wash is a cosmetic product for facial skin care that is routinely used every day as a wash to help facial skin problems such as removing dead skin cells, rejuvenating the skin, removing dirt, oil and providing moisture. The advantages of facial wash are considered more hygienic, easier to use, practically easy to store and carry (Marlina et al. 2022). Facial wash has a function to remove dead cells, rejuvenate skin cells, remove oil and dirt, reduce skin microbial flora, and make the skin fresh (Kumar et al. 2005). Facial wash is very effective for removing dirt and oil while moisturizing dry skin. The forms of facial wash are:

- Cream-based facial wash
- Gel-based facial wash
- Liquid-based facial wash
- Powder-based facial wash

In general, a facial is suitable for all skin types, but the various products currently available in the market are designed according to different skin types. For example, a facial for oily skin is intended for individuals with oily skin and does not contain oil in its face, and leaves a slight oily film on the skin. Based on skin type, face washes are classified into:

- Facial wash for oily skin
- Facial wash for dry skin
- Facial wash for normal skin (Solanki et al. 2020)

The advantages of facial wash products over other types of products are that facial wash can help evacuate dead skin cells, allow new skin cells to replace old skin cells, help maintain the freshness and health of the skin, give the skin a radiant appearance, help solve the problem of dead skin cells and excess oil that clog pores, the problem of acne and blackheads, and the removal of dead skin cells will make the skin slower to wrinkle (Koli, 2016).

1.2 Essential Oils

Essential oils are highly hydrophobic natural compounds extracted from aromatic plants (including flowers, roots, bark, leaves, seeds, peels, fruits, wood, and whole plants) that are widespread in the food and pharmaceutical industries, pest control, perfumery, cosmetics, and toiletries. The bioactivity of essential oils depends on various factors, namely extraction method, drying, storage, harvest time, climatic conditions, plant species, and mode of isolation. This richness of composition presents key characteristics in the various applications of essential oils, to contribute to the improvement of health, hygiene, beauty, and freshness (Guzman and Lucia 2021).

Essential oils are known as etheric oils produced by plants. They are volatile at room temperature without decomposition, have a bitter taste, smell fragrant according to the odor of the producing plant, generally soluble in the producing plant, generally soluble in organic solvents and insoluble in water (Isnaini et al. 2022). Essential oils can dissolve in alcohol at certain comparisons and concentrations. Thus, it can be known the amount and concentration of alcohol required to completely dissolve a certain amount of oil. In addition to dissolving in alcohol, essential oils can also dissolve in other organic solvents, less soluble in dilute alcohol with in other organic solvents, less soluble in dilute alcohol with a concentration of less than 70%. Oils that contain terpen compounds in large amounts will be difficult to dissolve (Kurniawan et al. 2020).

Many plants have been reported to contain essential oils or volatile oils that are classified based on the function of their origins as well as the properties and active compounds of essential oils. Some of the plants are summarized in Table 1.

<table>
<thead>
<tr>
<th>Plant Family</th>
<th>Essential Oil</th>
<th>Properties</th>
<th>Active Compounds</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apioceae</td>
<td>Carum nigrum (Black caraway), Anethum graveolens, Apium graveolens (Celery), Foeniculum vulgare (Fennel), Pimpinella anisum (Anise), Cuminum cyminum, Coriandrum sativum</td>
<td>Antibacterial, Antifungal, Antiviral</td>
<td>Citronellol, curzerene, limonene, linalool, (E)-β-ocimene, α-pinene, sabine, terpinolene</td>
<td>Kamte et al. 2018, Quassinti et al. 2013, Jamalova et al. 2021</td>
</tr>
<tr>
<td>Asteraceae</td>
<td>Artemisia Judaica, Artemisia annua, Artemisia absinthium (Wormwood), Artemisia dracunculus (Tarragon)</td>
<td>Antifungal, Antiviral</td>
<td>Camphor, β-carophyllene, 1,8-cineole, p-cymene, limonene, β-pinene, α-thujene, β-thujane</td>
<td>Rusatieny et al. 2021, Razafiarimanga et al. 2021</td>
</tr>
<tr>
<td>Lamiaceae</td>
<td>Origanum vulgare, Melissa officinalis (Lemon balm), Salvia officinalis, Mentha longifolia (Wild Mint), Mentha piperita (Peppermint), Mentha spicata, Ocimum basilicum (Sweet Basil), Rosmarinus officinalis (Rosemary), Lavandula officinalis (Lavender), Salvia sclarea (Sage Clary)</td>
<td>Antibacterial, Antifungal, Antiviral, Anti-inflammatory, Antibacterial, Antifungal, Antiviral, Anti-inflammatory, Antibacterial, Antifungal,</td>
<td>Carvacrol, p-cymene, Geraniol, Germacrene, limonene, linalool, γ-terpinene, terpine-4-ol, thymol</td>
<td>Shanaida et al. 2021, Ghasham et al. 2021</td>
</tr>
</tbody>
</table>
**1.2.1 Mechanism of Action of Essential Oils as Antimicrobial**

The mechanism of action of essential oils is directly related to the ability of hydrophobic substances to interact into cell membranes. The antimicrobial activity of essential oils has the effect of damaging the membrane to cause rupture of cell components. However, the mechanism of action through the membrane can also affect biochemical reactions (synthetic, protein, enzyme secretion) and very important processes occurring in cells (energy conversion, nutrition). Essential oils are also known to interact with DNA (Cheong et al. 2012).

**1.2.2 Mechanism of Action of Essential Oils as Antioxidant**

The mechanism of action of essential oils is by donating one hydrogen atom (H) to a free radical, so that a more stable compound can be formed (Pratt, 1992).

**2. PLANTS USED IN THE FORMULATION OF FACIAL WASH**

Many plants have been reported to be used in facial wash formulations due to the presence of essential oils or volatile oils in various plant materials such as flowers, rhizomes, bark, leaves, seeds, fruit peels, etc. Some of the plants used in facial wash formulations are summarized in Table 2.

<table>
<thead>
<tr>
<th>Essential Oils</th>
<th>Plant</th>
<th>Part of the plant</th>
<th>Properties</th>
<th>Active Compounds</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lauraceae</td>
<td>Cinnamomum verum (Cinnamon)</td>
<td>Antimicrobial, Antifungal</td>
<td>Netole, anisole, δ-cadinene, α-cadinol, β-caryophyllene, 1,8-cineole, α-cubebeine, linalool, γ-terpene, terpinen-4-ol</td>
<td>Damasceno et al. 2019, Salleh et al. 2015</td>
<td></td>
</tr>
<tr>
<td>Myrtaceae</td>
<td>Syzygium aromaticum (Clove), Thymus vulgaris (Thyme), Melaleuca alternifolia (Tea tree), Eucalyptus globulus (Blue gum), Myristica fragrans (Nutmeg)</td>
<td>Antibacterial, Antifungal, Antiviral, Antinflammatory</td>
<td>1,8-cineole, citronellol, geraniol, nerol, sabine, γ-terpene</td>
<td>Caputo et al. 2020</td>
<td></td>
</tr>
<tr>
<td>Rutaceae</td>
<td>Citrus medica (Lemon), Citrus paradisi (Grapefruit)</td>
<td>Antibacterial, Antifungal</td>
<td>Citronellol, limonene, linalool, linalyl acetate, β-phellandrene</td>
<td>Lobine et al. 2021, Silva et al. 2017</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2. Plant used in the formulation of facial wash**

<table>
<thead>
<tr>
<th>Essential Oils</th>
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<th>Part of the plant</th>
<th>Properties</th>
<th>Active Compounds</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turmeric</td>
<td>Curcuma longa</td>
<td>Rhizome</td>
<td>Antioxidant, anti-inflammatory, antibacterial, antifungal</td>
<td>ar-tumerone, α-tumerone, β-tumeron, tumorol, α-atlantont, β-kariofilen, linalool, 1,8 sineoltt</td>
<td>Rahardjo, et al. 2005, Orellana-Paucar et al. 2022</td>
</tr>
<tr>
<td>Jasmine</td>
<td>Jasminum officinale</td>
<td>Flowers</td>
<td>Antibacterial, antioxidant</td>
<td>Benzyl acetate, linalyl acetate, benzyl benzoate, methyl jasmonate, methyl anthranilate, linalool, nerol, geraniol, benzyl alcohol, farnesol, terpineol, phytools, eugenol, cis-jasmonc; acids, aldehydes and others</td>
<td>Sharmeen et al. 2021, Phuc et al. 2019</td>
</tr>
<tr>
<td>Black cumin</td>
<td>Nigella sativa</td>
<td>Seeds</td>
<td>Antioxidant, anti-inflammatory, antibacterial</td>
<td>Terpenes, p-cymene, β-pinene, thymoquinone, terpinen-4-ol, γ-terpinene, longifolene, carvareol Linalool, citronellol, geraniol, terpinen-4-ol, α-terpineol, methyl chavicol, eugenol, ethyl eugenol, limonene, camphene, α-pinene, β-pinene, γ-terpine, p-cymene, cis-ocimene, 1,8-cineole, linalyl acetate, fenchyl acetate, methyl cinnamate, β-caryophyllene</td>
<td>Bourgou et al. 2010</td>
</tr>
</tbody>
</table>
Peppermint  *Mentha piperita*  Aerial parts  Antibacterial, antioxidant

Lemongrass  *Cymbopogon citratus*  Grass leaf  Anti-inflammatory, antifungal, antibacterial, antiallergic, antistress, Citral, myrcene, dipentene, linalool, geraniol, nerol, citronellol, and farnesol, sesquiterpenes, methyl heptenone, esters, acids and others

Lavender  *Lavandula officinalis*  Flowering tops  Antibacterial, antioxidant  Borneol, caryophyllene, lavandulol, lavandulol acetate, linalool, linalyl acetate, α-terpineol, terpinene-4-ol

Tangerine  *Citrus reticulata*  Fruit peel  Antibacterial, anti-acne  Limonene, γ-terpinene, terpinolene, myrcene, α-pinene, p-cymene, α-thujene

Patchouli  *Pogostemon cablin*  Leaves  Antibacterial, antiseptic, antifungal, anti-inflammatory, antiviral  Patchoulenol, quaiene, seychella, patchoulol, α-patchoul, caryophyllene, pogostol, α-, β-, γ and δ-patchoulenol, seychella, cycloseychella, α- and β-bulnesene, α- and β-guaiena, anorpatchoulenol

Tea Tree  *Melaleuca alternifolia*  Leaves  Antiseptic, anti-inflammatory, antimicrobial  Terpinen-4-ol, γ-terpinene; α-Terpinene; 1,8-Cineole; Terpinolene; α-Terpineol

Geranium  *Pelargonium graveolens*  Stems, leaves, and flowers  Antibacterial, antioxidant, anti-inflammatory  Citronellol, geranial, caryophyllene oxide, menthone, linalool, β-bourbonene, iso-menthone, geranyl formate

<table>
<thead>
<tr>
<th>Products</th>
<th>Essential Oils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biona Ceudah Rupa Facial Foam</td>
<td>Patchouli</td>
</tr>
<tr>
<td>ST. Ives Acne Control Tea Tree Daily Cleanser</td>
<td>Tea Tree</td>
</tr>
<tr>
<td>The Art of Shaving Facial Wash</td>
<td>Peppermint</td>
</tr>
</tbody>
</table>

Table 3. Facial wash products available in market globally
FACIAL WASH PRODUCTS AVAILABLE IN MARKET GLOBALLY

Facial wash is becoming more famous among buyers as these products are getting recognized. The demand for facial wash is on the rise due to this pattern across the globe. In the facial wash market worldwide, there are now many facial wash products available that contain essential oils. Some examples of facial wash products available in the global market are summarized in Table 3.

4. CONCLUSIONS

Based on the journal review above, we can conclude that essential oils are not only useful as a scent, but can also be formulated into a facial wash that has various benefits. The development of essential oil-based formulations is mainly focused on creating safe and elegant products that can be accepted by many individuals. Essential oils are also considered safe and provide a wide range of medicinal properties that are important in facial wash formulations, such as antibacterial, antioxidant, and anti-acne capabilities. In recent years, many products have been marketed in the global market, which is evidenced by the development of essential oil-containing facial wash in the cosmetic industry.

REFERENCES


 Pramesi A.N. 2016. Formulasi Sediaan Sabun Wajah Minyak Atsiri Kayu Manis (Cinnamomum burmanni)


