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Use of Sea Buckthorn Oil in the Treatment of Skin Disease: Anti-Inflammatory Benefits, Clinical Applications, and Formulary Challenges

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Abstract

Skin diseases such as psoriasis, atopic dermatitis, burns, and other barrier insults pose ongoing therapeutic challenges, often requiring treatments that address both inflammation and skin barrier repair. The primary aim of this review is to provide a comprehensive overview of the potential benefits of sea buckthorn oil, derived from *Hippophae rhamnoides*, as a treatment for various skin diseases, detailing its anti-inflammatory properties, reporting benefits across several skin conditions, and highlighting challenges in formulation as well as preservation of the oil's nutritional benefits. Drawing from a wide array of existing literature, this review investigates sea buckthorn oil's rich composition of omega fatty acids, vitamins, and antioxidants, which may contribute to its therapeutic effects by modulating inflammatory pathways and enhancing skin barrier function. Clinical trials and patient case studies indicate that sea buckthorn oil shows promise in reducing erythema, inflammation, and improving skin sensitivity. However, challenges such as formulation stability, sourcing of quality oil, and variability in response to treatment across conditions need to be addressed. Future research should focus on optimizing formulations and conducting large-scale clinical trials to validate the therapeutic efficacy of sea buckthorn oil in the management of skin diseases.

Additionally, further exploration of the regulatory mechanisms underlying its ability to modulate inflammation and repair the skin barrier is needed to fully elucidate its clinical potential. Sea buckthorn oil offers a novel and promising adjunctive treatment for psoriasis, atopic dermatitis, and wound-healing with significant potential to enhance therapeutic options for additional skin diseases.

Keywords

Anti-Inflammatory, Skin Barrier, Sea Buckthorn Oil, Psoriasis, Atopic Dermatitis, Wound-Healing

1. Introduction and Background

Sea buckthorn oil is derived from the plant, *Hippophae rhamnoides,* and has long been valued in traditional medicine for its therapeutic properties [1]-[3]. Extracted from the berries and seeds of the plant, the oil is rich in omega fatty acids, vitamins, and antioxidants, presenting a compelling profile for incorporation into skincare [2] [3]. These bioactive compounds are central to the oil's proposed ability to target inflammation and repair skin barrier damage in challenging dermatological conditions, as discussed in this paper. The berries themselves are challenging to harvest due to the thorns surrounding them, but the oil they produce has been widely used for centuries across regions of Asia and Europe. Recent studies have begun to validate sea buckthorn oil's efficacy for skin health, especially in treating inflammatory and barrier-related skin conditions. This therapeutic promise aligns with modern demands in dermatology for adjunctive treatments, particularly in conditions that defy conventional therapies.

Historically, sea buckthorn oil was used to treat a variety of ailments, including skin, cardiovascular, and gastrointestinal conditions [2] [3]. Its name, derived from the ancient Greek word "*Hippophae*," refers to its early use in enhancing the appearance of horses' coats [1]. In recent times, scientific research has highlighted the oil's potential in treating modern skin conditions including burns, acne, and psoriasis due to its anti-inflammatory and anti-cancer antioxidant properties. This review examines how the bioactive components of sea buckthorn oil might support skin health in a modern therapeutic context, particularly through reducing inflammation and enhancing the skin barrier in dermatological conditions. Given the prevalence of such conditions and complexities surrounding their management, sea buckthorn oil has gained attention as a possible adjunct therapy for managing inflammatory skin diseases and disorders related to skin barrier dysfunction.

Numerous bioactive compounds play a crucial role in the delicate homeostasis of skin health. As the largest organ in the human body, the skin is responsible for a range of essential functions, including protecting internal tissues from harmful external agents, maintaining water and electrolyte balance, regulating temperature,

supporting immune function, processing sensory input, and managing metabolism, absorption, storage, and removal of various substances [4]. To maintain its integrity and proper functioning, the skin depends on a variety of bioactive compounds. For example, fatty acids such as polyunsaturated omega-3 and omega-6 are vital for preserving the skin barrier and thought to provide anti-inflammatory defenses [5]. Additionally, vitamins A, C, D and E, along with minerals such as selenium, copper, zinc, and silicon, as well as carotenoids and polyphenols, help protect the skin from UV-induced photodamage through their antioxidant properties [4] [6]. This complex interplay of nutrients and bioactive compounds underscores the potential of sea buckthorn oil as a complementary treatment for skin conditions through modification of the pathophysiologic mechanisms involved in skin inflammation.

Given the multifactorial nature of skin conditions such as atopic dermatitis, psoriasis, burns, and other wounds, sea buckthorn oil has attracted increasing interest as a therapeutic agent that can modulate inflammatory pathways and support skin barrier repair. The rich bioactive composition of sea buckthorn oil, including essential fatty acids and antioxidants, positions it as an innovative adjunct therapy in dermatology. However, despite promising clinical observations, several challenges remain, particularly regarding the stability of the oil in formulations, variability in patient response, and sourcing of high-quality oil for consistent therapeutic outcomes. This review aims to discuss the properties of sea buckthorn oil which present such promise for use in skincare, and evaluate the existing clinical evidence supporting the use of sea buckthorn oil in treating various skin conditions, addressing formulation and application challenges, and outlining future research directions to optimize its clinical utility.

2. Methods

This literature review critically evaluated 40 peer-reviewed studies to explore the composition and therapeutic potential of sea buckthorn oil in managing skin conditions including psoriasis, atopic dermatitis, burns, and other forms of wound healing. A comprehensive search was conducted using databases such as PubMed, Google Scholar, and Embase. The search terms included "sea buckthorn," "sea buckthorn oil," "psoriasis," "atopic dermatitis," "burns," "wound healing," "skin barrier repair," and "immune modulation." Studies were selected based on their relevance to the review topic, specifically focusing on the biochemical properties of sea buckthorn oil, such as its anti-inflammatory, antioxidant, and immunomodulatory qualities, as well as overall impact on skin health across multiple skin conditions. Articles written in English and published in peer-reviewed journals were included. The 40 studies selected for this review represented a range of study designs, including randomized controlled trials (RCTs), case reports, *in vitro* studies, and in vivo research. Each study was analyzed for its contributions to understanding the potential of sea buckthorn oil in improving skin health, modulating inflammatory processes in the skin, and impacting various skin diseases. Key information extracted included study design, method of sea buckthorn oil

application, dosage, treatment duration, and primary outcomes related to symptom improvement, lesion characteristics, and other relevant endpoints.

3. Review

3.1. Composition and Properties of Sea Buckthorn Oil Applicable to Modulation of Skin Inflammation

Sea buckthorn (*Hippophae rhamnoides*) is celebrated for its diverse array of bioactive compounds, which are influenced by factors such as geographic location, subspecies, growth conditions, and extraction methods. Cold-pressed extraction is particularly valued for retaining the full spectrum of these compounds. The oil can be derived from various parts of the plant, including the whole berry, pulp, and seed, each yielding unique profiles of fatty acids, vitamins (A, C, and E), phytosterols, flavonoids, and carotenoids [7]. Seed oil, in particular, is rich in polyunsaturated fatty acids like linoleic acid (omega-6) and linolenic acid (omega-3), as well as the monounsaturated fatty acid palmitoleic acid (omega-7). It also contains saturated fatty acid palmitic acid, monounsaturated fatty acid oleic acid, and trace amounts of myristic and stearic acids, along with minerals such as selenium, copper, zinc, and silicon [8]. Together, these components enhance skin barrier function, structural integrity, and inflammatory defense, making sea buckthorn oil a valuable therapeutic agent for conditions such as atopic dermatitis and psoriasis (Table 1).

Table 1. Biochemical mechanisms of action of sea buckthorn (*Hippophae rhamnoides*) oil in skin health and disease management.

Biochemical Component	Skin Health Benefits
Omega-3 (Linolenic Acid)	Enhances anti-inflammatory effects, contributes to skin barrier integrity, supports wound healing, and reduces inflammation.
Omega-6 (Linoleic Acid)	Reinforces skin barrier function, supports hydration, and alleviates inflammation.
Omega-7 (Palmitoleic Acid)	Exhibits anti-inflammatory and antimicrobial properties, targeting pathogens like *Staphylococcus aureus* and *Propionibacterium acnes*. Promotes epidermal regeneration, maintains moisture, and aids in burn recovery.
Oleic Acid	Supports skin permeability, hydration, and regeneration, playing a critical role in skin repair and overall moisturization.
Palmitic Acid	Promotes keratinocyte and fibroblast proliferation, aiding in skin repair without triggering inflammation. Beneficial in conditions with keratinocyte damage or VEGF overexpression, such as psoriasis.
Vitamin A	Promotes epithelial health and repair while providing antioxidant benefits that combat oxidative stress in inflammatory skin conditions.
Vitamin C	Strengthens skin resilience, neutralizes free radicals, and mitigates oxidative stress, particularly in chronic inflammatory skin diseases such as eczema.
Vitamin E (Tocopherols)	Reduces oxidative stress, decreases inflammation, and improves skin elasticity. Aids in burn recovery by enhancing epidermal regeneration and maintaining moisture.

Continued

Carotenoids	Provide antioxidant effects that mitigate oxidative damage, support skin resilience, and assist in the recovery of burns and inflammatory skin conditions.
Flavonoids	Exhibit anti-inflammatory and antimicrobial properties, reducing redness, swelling, and microbial triggers in conditions such as rosacea and psoriasis.
Phytosterols	Modulate inflammation, support skin repair, and reinforce barrier function, aiding in the healing of chronic wounds and burns.
Selenium, Copper, Zinc, and Silicon	Contribute to antioxidant activity and support skin barrier integrity, aiding in the repair of skin barrier dysfunction caused by inflammation or environmental damage.
Polyphenols	Protect against UV-induced photodamage and reduce oxidative stress, helping prevent progression of skin diseases and enhancing skin resilience.

Sea buckthorn pulp oil stands out due to its high concentration of palmitoleic acid, a rare fatty acid with significant anti-inflammatory properties. This makes it especially beneficial for treating conditions such as rosacea, as it reduces chronic inflammation and alleviates symptoms like erythema and irritation [9]. Additionally, palmitoleic acid has demonstrated antimicrobial activity against skin pathogens like *Staphylococcus aureus* and *Propionibacterium acnes*, which have been implicated in exacerbating rosacea and acne symptoms [2]. Combating inflammation and microbial triggers makes sea buckthorn oil a strong candidate for addressing multiple pathways in skin disease pathogenesis.

In addition to pulp oil, the fatty acid composition of seed oil, which is rich in linolenic and linoleic fatty acids, further enhances the anti-inflammatory benefit and contributes to overall skin barrier health [9]. These essential fatty acids reinforce the skin's barrier, protect against environmental stressors, and prevent moisture loss. This synergistic action supports long-term skin healing and regeneration, providing a holistic approach to managing chronic conditions like rosacea, psoriasis, and atopic dermatitis. Together, the pulp and seed oils address immediate inflammation and provide ongoing protection and repair, offering a sustainable therapeutic solution.

In addition to its anti-inflammatory properties, sea buckthorn oil is abundant in antioxidants, including vitamins A, C, and E (tocopherol), along with carotenoids and flavonoids [10]. These antioxidants contribute to sea buckthorn oil's capability to neutralize free radicals and mitigate oxidative stress, which is particularly beneficial in chronic inflammatory skin conditions such as atopic dermatitis. This not only helps to prevent the progression of skin diseases but also strengthens the skin's resilience against environmental stressors such as UV radiation and pollution [11]. Leveraging the benefits of sea buckthorn oil in combination with conventional treatments offers a multifaceted approach to address the multifactorial pathophysiologic mechanisms of chronic skin diseases and in symptom management.

3.2. Clinical Evidence: Efficacy of Sea Buckthorn Oil in Improving Skin Health and Treating Disease

Skin Health and Barrier Improvement

Sea buckthorn has garnered attention for its antioxidant and anti-inflammatory properties, sparking interest in its diverse bioactive components and their potential benefits for skin health. However, prior to discussing the existing clinical evidence for its use in various skin diseases, it is crucial to evaluate its baseline effects on skin cells. In a randomized clinical trial, Dudau *et al*. investigated the effects of sea buckthorn seed oil by purifying it into four fractions enriched with saturated and unsaturated fatty acids [12]. The study found that the palmitic acid-enriched fraction was biocompatible with skin cells, non-toxic, and promoted the proliferation of keratinocytes and dermal fibroblasts without triggering inflammation or vascular endothelial growth factor (VEGF) synthesis. These findings suggest that the palmitic acid fraction of sea buckthorn oil may offer therapeutic potential for conditions involving keratinocyte damage or diseases characterized by increased VEGF levels, such as psoriasis, thus supporting the anti-inflammatory promise [12]. In addition, this study underscores the need for further research into the optimal fractionation of sea buckthorn oil to isolate bioactive components that target specific inflammatory pathways as well as provide an overall benefit to skin health.

Skin thinning, atrophy, and loss of elasticity are common consequences of chronic ultraviolet (UV) exposure, often observed in sun-exposed areas, as well as in regions affected by prior trauma or burns and through hormone-mediated alterations in epithelial tissue. Larmo *et al*. explored the effects of oral sea buckthorn oil on vaginal atrophy in postmenopausal women, examining parameters like elasticity, epithelial integrity, moisture, and fluid volume [13]. The study found that sea buckthorn oil significantly improved vaginal epithelial integrity compared to the placebo group, highlighting its potential to enhance epithelial health in conditions related to skin atrophy. However, no significant improvements were noted in elasticity, fluid volume, or moisture levels, and participants did not report changes in vaginal symptoms. These results emphasize the potential of sea buckthorn oil to support epithelial integrity, contributing to broader applications in managing skin atrophy and compromised epithelial tissue.

A separate clinical trial assessed the effects of daily, oral sea buckthorn oil supplementation on skin health. Female participants who consumed sea buckthorn capsules over four weeks exhibited marked improvements in facial skin brightness, moisture, and elasticity, with the most pronounced increase in moisture levels observed after eight weeks [14]. Additionally, a reduction in skin redness and a notable improvement in skin texture, evidenced by a decreased number of visible pores, were observed compared to the placebo group. Skin collagen density also increased by 3.3% after four weeks and by 10% after twelve weeks of sea buckthorn consumption. These findings suggest that sea buckthorn oil supplementation could enhance multiple valuable skin parameters, supporting its potential as a comprehensive treatment for improving overall skin health.

3.3. Psoriasis

Recent research has shown the potential of sea buckthorn oil in treating dermatologic conditions such as atopic dermatitis and psoriasis, primarily due to its high fatty acid content and powerful antioxidant properties [15]. Psoriasis is a chronic inflammatory condition characterized by thick, scaling plaques on the skin that may also possess joint involvement. To evaluate sea buckthorn oil's efficacy in treating psoriasis, Balkrishna *et al*. conducted an *in vitro* study on human monocytic cells, which demonstrated the oil's anti-inflammatory potential [16]. This was followed by in vivo experiments using rat models with carrageenan-induced paw edema and 12-O tetradecanoylphorbol-13-acetate (TPA)-induced psoriasis-like lesions. Results showed that both oral and topical applications of sea buckthorn oil significantly reduced paw edema and, in the TPA models, reduced both edema and epidermal thickening. These findings highlight the dual potential of sea buckthorn oil for topical and systemic applications.

Similarly, a study by Sulthana *et al*. explored the effects of sea buckthorn oil on mice with imiquimod-induced psoriasis-like lesions [17]. The study found that topical application of the oil resulted in a notable reduction in redness, scaling, and inflammation. These findings further validate sea buckthorn oil's anti-inflammatory properties, specifically its ability to reduce plaque thickness in psoriasis. The consistent positive results of sea buckthorn oil for treatment of psoriatic lesions across animal studies point toward the necessary study of sea buckthorn oil in human subjects. Ultimately, these preclinical studies suggest that sea buckthorn oil could play a significant role in managing inflammation and skin barrier dysfunction in psoriasis.

Building on this preclinical evidence, Boca *et al*. conducted a clinical trial involving human subjects with treatment-naive psoriasis to assess the topical application of sea buckthorn oil over an eight-week period [18]. Patients applied the oil to psoriatic lesions on one side of their body and a placebo on the other, with lesion changes measured using the Psoriasis Area Severity Index (PASI). After four weeks, the lesions treated with sea buckthorn oil showed significant improvement in PASI scores compared to baseline, while placebo-treated lesions worsened. By week eight, the PASI scores for the sea buckthorn-treated side were significantly better than those for the placebo-treated side.

Moreover, the trial by Boca *et al*. measured participants' Dermatology Life Quality Index (DLQI), which reflected improvements in quality of life for all patients over the eight-week treatment period [18]. These findings highlight the potential of sea buckthorn oil not only to reduce psoriatic plaque severity but also to enhance patient well-being. Given the chronic nature of psoriasis and the ongoing search for effective adjunctive therapies, sea buckthorn oil represents a promising alternative or complementary option. Future research should focus on larger-scale clinical trials to further quantify its efficacy and potential integration into standard psoriasis treatment protocols.

3.4. Atopic Dermatitis

Atopic dermatitis, a common and often debilitating chronic skin disease, is characterized by persistent inflammation and severe pruritus. The anti-inflammatory properties of sea buckthorn oil have prompted researchers to explore its potential as a treatment for this condition. In one clinical study, patients with atopic dermatitis were given oral supplementation of either sea buckthorn pulp oil or seed oil [19]. Results showed that participants receiving pulp oil experienced significant improvement in dermatitis symptoms, while those in the seed oil group also reported some relief, albeit to a lesser degree. This initial success in human trials has inspired further preclinical investigations to better understand the oil's mechanisms and effects.

In a study by Hou *et al*., topical application of sea buckthorn oil was tested on mice with induced atopic dermatitis-like lesions, resulting in marked improvements including reduced lesion severity and decreased epidermal thickening [20]. Another mouse model study examined the effects of oral sea buckthorn oil, finding significant reductions in both lesion severity and skin thickness [21]. Interestingly, the improvement was dose-dependent, with higher doses (10 ml/kg) showing greater efficacy than lower doses (5 ml/kg). These results suggest that sea buckthorn oil's immunomodulatory properties may play a role in controlling the inflammatory process in atopic dermatitis.

A study by Gu *et al*. provides additional evidence of sea buckthorn oil's impact on skin barrier repair, focusing on its immunomodulatory effects in atopic dermatitis models [22]. The study demonstrated that the essential fatty acids in sea buckthorn oil, combined with its anti-inflammatory properties, contribute to the restoration of the skin barrier. The consistency of these effects across different models suggests that sea buckthorn oil could be beneficial for human patients as well. While the existing evidence is promising, further research is needed to compare the effectiveness of topical application versus oral supplementation of sea buckthorn oil in atopic dermatitis treatment.

3.5. Burns and Other Forms of Wound Healing

Burns and chronic wounds are major global health challenges, particularly in low- and middle-income countries where burns account for approximately 180,000 deaths annually [23]. The burden of chronic wounds, such as venous leg ulcers and diabetic foot ulcers, is also increasing, driven by aging populations and rising rates of diabetes and obesity [24]. These injuries often complicate the healing process, elevating the risk of infection, tissue damage, and fluid loss. Severe cases can lead to life-threatening complications, including sepsis and organ failure, further delaying recovery and increasing mortality [25]. While current treatments like infection control, moisture regulation, and skin grafting are essential for severe burns, there remains a need for therapies that more effectively reduce inflammation and promote tissue regeneration [26].

Recent research has highlighted the potential of sea buckthorn oil as an adjunct

in wound care, particularly for burns. Sea buckthorn oil contains bioactive compounds with anti-inflammatory and regenerative properties that are beneficial in treating burns. In a randomized clinical trial, sea buckthorn oil was found to accelerate healing in patients with second-degree burns compared to conventional treatments like silver sulfadiazine, resulting in faster recovery times and improved skin appearance [27]. The findings suggest that sea buckthorn oil could significantly enhance tissue repair, reduce recovery duration, and provide a promising alternative for clinical use. The implications of this study underscore the potential of sea buckthorn oil to improve burn treatment outcomes, warranting further clinical investigation.

In addition to its regenerative properties, sea buckthorn oil has demonstrated an ability to maintain moisture, a crucial factor in effective wound management [28]. This is particularly important in preventing complications such as dehydration of the skin, which can impede the healing process. The oil's composition, rich in omega-7 fatty acids (notably palmitoleic acid), tocopherols, and carotenoids, supports enhanced skin barrier function and epidermal regeneration [29]. These components are vital for maintaining moisture levels, reinforcing the skin barrier, and reducing fluid loss, a common complication in burn injuries [1]. The fatty acid profile of sea buckthorn oil also strengthens skin hydration, underscoring its potential role in both acute and chronic wound care.

Furthermore, in addition to its physical healing properties, sea buckthorn oil offers significant anti-inflammatory and antioxidant benefits that further support wound recovery. Tocopherols (vitamin E), carotenoids, and polyunsaturated fatty acids (omega fatty acids) within the oil help reduce oxidative stress, a factor that can exacerbate inflammation and impair healing [3]. The high vitamin C and E content in sea buckthorn oil contribute to its antioxidant effects, further enhancing its capacity to suppress inflammation and promote faster recovery. These combined anti-inflammatory and antioxidant effects make sea buckthorn oil a versatile therapeutic option for improving wound healing outcomes across different stages of recovery.

Sea buckthorn oil's regenerative and hydrating properties may also contribute to improved patient satisfaction and quality of life during recovery. In clinical studies, patients reported better wound appearance and texture when treated with sea buckthorn oil, leading to a more positive recovery experience[27]. The oil's ability to improve skin elasticity and overall feel likely enhances patient perceptions of healing [1]. While more standardized, large-scale clinical trials are needed to validate these outcomes comprehensively, preliminary evidence suggests that sea buckthorn oil has considerable potential not only to improve clinical results but also to enhance patient well-being throughout the recovery process.

4. Discussion

Current Challenges and Future Directions for Clinical Use of Sea Buckthorn Oil

While sea buckthorn oil holds significant promise for therapeutic applications,

several challenges must be addressed to enhance its clinical utility. One major obstacle is the oil's susceptibility to oxidation due to its high concentration of unsaturated fatty acids, which contributes to a limited shelf life and reduced efficacy when degraded [30]. This issue not only impacts stability but also leads to the formation of potentially harmful byproducts like peroxides and free radicals when the oil becomes rancid [30]. Furthermore, the high water content and thin skins of sea buckthorn berries necessitate rapid processing to maintain quality and prevent degradation [31]. Innovative techniques such as microencapsulation have demonstrated potential in stabilizing the oil's active components, extending its shelf life, and improving its suitability for cosmetic and nutritional applications [32].

A major challenge in assessing the benefits of sea buckthorn oil for various skin diseases is the variability in oil composition depending on the plant part used for extraction. Pulp oil is more anti-inflammatory, while seed oil contains higher levels of fatty acids, making it more effective for skin barrier repair [9]. This compositional diversity necessitates combining both types of oil to optimize treatment for chronic inflammatory skin conditions. Additionally, inconsistent labeling and product content can confuse consumers, as the oil's composition can vary based on species, location, climate, and extraction methods [33] [34]. Standardizing extraction methods and implementing accurate labeling practices would enhance consumer trust and therapeutic reliability.

To enhance the oil's formulation and delivery, future research should explore advanced strategies like liposomal encapsulation and nanocarrier-based systems. These technologies could significantly improve the bioavailability and targeted delivery of the oil's active compounds, addressing issues related to stability, absorption, and tissue penetration [35]-[37]. Enhanced delivery systems may amplify sea buckthorn oil's effectiveness in modulating inflammatory pathways and expand its range of dermatological applications. Additionally, combining sea buckthorn oil with other anti-inflammatory agents, such as squalene, chamomile, or rosehip oil, could yield synergistic effects, broadening its use in dermatology. The stabilization of sea buckthorn oil would allow for more widespread use and availability for further research.

The need for data regarding the use of sea buckthorn oil in various conditions limits current research progress. Large-scale, randomized controlled trials are essential to establish the clinical efficacy of sea buckthorn oil. Trials should include larger sample sizes, consistent protocols, and standardized outcome measures to allow for robust evidence and meta-analyses. This approach will help determine optimal dosages, treatment durations, and potential interactions with other medications. Many studies provided data observed in pre-clinical models. For a complete understanding of the potential of sea buckthorn oil, more clinical studies must be performed to explore the impact on patients managing skin conditions. In patients with various skin conditions, both oral and topical modalities should be studied to determine maximum efficacy.

While preliminary research indicates benefits for conditions like atopic dermatitis, psoriasis, and wound healing, long-term studies are needed to evaluate the oil's safety, particularly for chronic use. Monitoring for potential cumulative effects or late-onset adverse reactions is crucial. Of note, more head-to-head analysis of sea buckthorn oil is needed compared to standard of care treatments for the conditions discussed in this paper. This includes directly analyzing the oil's efficacy compared to these treatments, as well as exploring the use of the oil as an adjuvant therapy. This would lead to a better understanding of the place sea buckthorn oil has in treating dermatologic conditions.

Sustainability and ethical considerations are also important in the production of sea buckthorn oil. The labor-intensive nature of its harvesting highlights the need to evaluate the environmental impact of large-scale cultivation, develop sustainable harvesting techniques, and ensure fair labor practices [38]-[40]. Additionally, research should assess the potential socioeconomic benefits of cultivating sea buckthorn, particularly in rural or economically disadvantaged regions. By addressing these priorities, the scientific community can better understand sea buckthorn oil's long-term safety, therapeutic potential, and broader implications for public health and environmental sustainability.

5. Conclusion

Sea buckthorn oil, rich in omega-7 fatty acids, tocopherols, and carotenoids, has demonstrated significant skin health benefits in clinical trials and animal studies. Oral supplementation may improve skin brightness, moisture, and elasticity, with moisture levels peaking at eight weeks and skin redness reducing over time. Its anti-inflammatory and barrier-enhancing properties help manage rosacea, acne, psoriasis, and atopic dermatitis by reducing redness, irritation, and inflammation. These findings support the potential of sea buckthorn oil as a natural adjunct in treating inflammatory skin conditions, warranting further exploration. Improvements in psoriatic plaque thickness, redness, and scaling, and immune modulation in atopic dermatitis further highlight its therapeutic potential. While the current evidence is promising, future research should focus on determining optimal dosages, comparing topical and oral applications, and conducting large-scale trials to confirm its safety, efficacy, and potential interactions with other treatments. Addressing such gaps in the existing scientific literature is crucial for fully integrating sea buckthorn oil into dermatological care as a reliable adjunctive therapy. Sea buckthorn oil shows significant potential to expand therapeutic options for chronic skin conditions, providing a natural approach to enhancing skin health.

Conflicts of Interest

The authors have no relevant financial or non-financial conflicts of interest to report. This study was conducted without external funding; the authors covered all research costs independently.

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