

**FORMULATION AND EVALUATION OF
SNAIL MUCIN ANTI-WRINKLE LOTION**



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ABSTRACT

Investigating, formulating, and testing an anti-wrinkle lotion that contains snail mucin was the objective of our study. Hyaluronic acid, glycoproteins, and glycolic acid make up the majority of snail mucin; all three have long been known to have positive effects on the skin. The substance that the snail excretes is known as snail slime or snail mucin. In the skincare industry, new ingredients and products are continuously being added. Although it has been extensively used by Koreans in their domestic cosmetic products for many years, snail mucin is one of the ingredients that has recently entered the pharmaceutical cosmetic market. There are many skin-care advantages to snail mucin. In contrast to the majority of the present anti-wrinkle arsenal, it avoids dryness and gives the skin a dewy appearance while using fewer allergenic substances. Snail mucin may also have additional powers to lock in moisture and repair skin. Skin care products with snail mucin have been shown in clinical research to reduce facial wrinkles and creases. The process for producing oil in water emulsions involves distributing a smaller amount of oil into a larger amount of water. The emulsifier molecules contain the tiny oil droplets as they spread them through the aqueous medium, which is referred to as the "external phase" giving the oil phase its name. The water "wraps around the oil." These lotions feel lighter and sink into the skin more easily without leaving a greasy film behind. We formulated and evaluated an anti-wrinkle lotion with snail mucin extract as the main ingredient. We evaluated the lotion for its homogeneity, organoleptic properties, acid value, spreadability and pH value. After evaluation, the lotion was found to be stable, acceptable and aesthetically appealing.

Keywords : Anti wrinkle; Anti aging; Snail mucin; Lotion; Skin care;

INTRODUCTION

A cosmeceutical is any ingredient or product with medicinal properties, which manifest beneficial topical actions and provides protection against degenerative skin conditions. The term 'cosmeceuticals' was coined in 1980 by the dermatologist Albert Kligman. Cosmeceuticals are the fastest growing segment of the personal care industry, driven by factors such as globalization of the beauty market and sociocultural desire to maintain a youthful appearance. Nowadays patients are increasingly seeking skincare products to address dermatologic concerns such as acne, fine lines, wrinkles, ageing, hyperpigmentation and dullness. Demand for anti-wrinkle product services and devices is set to rise at 5.5% CAGR (compound annual growth rate) between 2023 and 2033. In 2022, the global anti-wrinkle products services and devices market was estimated to be worth about US \$59 billion.

Nowadays people are much concerned about skin health, they may seek advice from dermatologist regarding the safety and efficacy of cosmeceuticals. Despite being outside of the body, skin may provide an amazingly clear window into what's going on within. Skin begins to wrinkle overtime. Skin can become less elastic due to environmental factors including ultraviolet rays from the sun. Skin can droop and wrinkle as a result of gravity.

The mucus produced by molluscs like *Achatina fulica* (African giant land snail) and *Cornu aspersum* (formerly *helix aspersum* and *Cryptophalus aspersus*, common brown garden snail) is commonly found in Korean cosmeceuticals for their antimicrobial and skin regenerative properties. Snail mucin is a snail's secretion, it is also referred as snail secretion filtrate (SSF) or snail slime in ingredient list.

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Due to their advantageous dermatologic quality the secretions of molluscs like *Achatina fulica*, *Cornu aspersum* and *Cryptophalus aspersus* are frequently found in several creative skin care products. Snail mucin has been found to treat photoaging, atopic dermatitis, partial thickness burns and acute radiation dermatitis. They are commonly found in some innovative skin care products for their beneficial dermatologic properties, mucin has found to contain antibacterial chemicals such as glycosaminoglycans or mucopolysaccharides (hyaluronan, chondroitin, heparin) and glycosylated proteins, which can facilitate wound healing and repairing by preventing bacterial infections. The mucus of several snail types has been shown to have inhibitory and bactericidal potency against *Staphylococcus* sp., *Sreptococcus* sp. and *Pseudomonas* sp. isolated from wounds. Thus, if more adequate exploration is carried out, the mucus of these snails could become useful source for antibacterial agents that can be used in wound treatment. Treatment with secretions of *Caspera* was found to promote the proliferation, migration and survival of human keratinocytes and dermal fibroblasts invitro, supporting its regenerative and wound healing properties. The ability of human skin to rejuvenate itself and the remodelling ability of the extracellular matrix (ECM) deteriorates with time. Skin ageing compromises the remodelling abilities of ECM as dermal fibroblasts are less proficient at proliferation and migrating to sites of injured tissue in order to manipulate the ECM and promote skin healing.

Lotion is an external cosmetic or medical liquid preparation. Lotions are low viscosity preparations meant to be applied to the skin. Creams and gels, in contrast, have a higher viscosity since they often contain less water. Although a lotion may be used to carry medication, many lotions, particularly hand lotions, body lotions,

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and lotion for allergies, are only intended to moisturise, soften, and occasionally perfume the skin. Some healthcare items, including sunscreen and moisturiser, could come in a variety of forms, including lotions, gels, creams, and sprays. Lotions are prescribed by dermatologists to treat or prevent several skin conditions. The same medicinal ingredient frequently appears in lotion, cream, and ointment forms. A lotion is less viscous and can be easily applied to parts of skin with hair, such as the scalp. Historically, lotions also had the advantage of being able to cover a lot of skin at a lower cost than creams or ointments, but this advantage has been slowly lost as a result of product development. On skin prone to acne, non-comedogenic lotions are advised. Although other types, including tanning lotion, also exist, moisturising lotions make up the majority of cosmetic lotions. Lotions maintain skin's hydration levels by locking in the moisture, keeping the skin healthy, soft, and supple. Unlike a cream, the lotions are less greasy and have more water content. Lotions, with their diverse range of formulations and benefits, have become a popular choice for nourishing and pampering the skin. ^[1]

The common characteristics of lotion includes:

- **Hydration and Moisture:** Lotions serve as a vital tool in maintaining skin hydration and moisture balance. Their lightweight formulations are designed to penetrate the skin, delivering essential ingredients that replenish lost moisture. Regular application of lotions can help combat dryness, prevent moisture loss, and promote soft, supple skin.
- **Protective Shield:** Beyond hydration, lotions create a protective barrier on the skin's surface. This shield acts as a defense against environmental stressors, such as pollution and harsh weather conditions. By forming a barrier, lotions help

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shield the skin from potential damage, supporting its natural ability to repair and regenerate.

- **Nourishment and Vitality:** Lotions are not limited to surface-level benefits, they can also provide nourishment and vital nutrients to the skin. Many lotions are enriched with vitamins, antioxidants, and botanical extracts, offering a boost of essential elements that promote skin health. These ingredients work synergistically to revitalize the skin, leaving it looking vibrant and refreshed.
- **Customized Solutions:** One of the remarkable aspects of lotions is their versatility. With a myriad of options available, you can find lotions tailored to specific skin types, concerns, and preferences. Whether you have dry skin, oily skin, or specific skin conditions, there is a lotion formulated to address your unique needs. This customization ensures that you can find the perfect lotion to enhance your skincare.^[2]

The skin, our body's largest organ, undergoes a natural aging process influenced by various intrinsic and extrinsic factors. As we progress through life, it is essential to comprehend the underlying mechanisms behind skin aging to empower ourselves with knowledge and adopt effective strategies for maintaining skin health and vitality. The process of aging causes collagen degradation which leads to the development of fine lines and wrinkles in the skin.

Appearance of wrinkles and fine lines are due to :

- ✧ **Intrinsic Aging:** Intrinsic aging, also known as chronological aging, refers to the inevitable changes that occur within our skin as a result of the passage of time. This natural aging process is influenced by genetic factors and occurs irrespective of external influences. Over time, intrinsic aging leads to a gradual decline in

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collagen and elastin production, resulting in the loss of skin elasticity, fine lines, and thinning of the epidermis.

- ✧ **External Factors and Extrinsic Aging:** Extrinsic aging encompasses external factors that accelerate the aging process and contribute to visible signs of skin aging. The primary culprits include sun exposure, environmental pollutants, lifestyle choices, and repetitive facial expressions. Prolonged and unprotected exposure to ultraviolet (UV) radiation from the sun, for instance, leads to the breakdown of collagen and elastin fibers, resulting in wrinkles, sunspots, and uneven skin tone.
- ✧ **Oxidative Stress and Free Radicals:** Another key player in skin aging is oxidative stress, caused by an imbalance between free radicals and the body's antioxidant defenses. Free radicals are highly reactive molecules generated by various sources such as UV radiation, pollution, and metabolic processes. When left uncontrolled, these free radicals can damage DNA, proteins, and lipids within the skin cells, accelerating the aging process and contributing to the development of wrinkles, dullness, and uneven skin texture.
- ✧ **Collagen and Elastin Degradation:** Collagen and elastin are crucial proteins that provide structural support and elasticity to the skin. However, as we age, the production of these proteins naturally declines, and existing fibers become fragmented and less organized. This degradation leads to decreased skin firmness, increased laxity, and the formation of wrinkles and sagging.
- ✧ **Lifestyle and Skincare Practices:** While certain factors are beyond our control, adopting healthy lifestyle practices and skincare habits can help slow down the skin aging process. Regular use of broad-spectrum sunscreen, proper hydration, a

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balanced diet rich in antioxidants, avoiding smoking, and managing stress levels are among the lifestyle choices that can contribute to maintaining youthful and healthy-looking skin.^[3]

The youthfulness of the skin can be preserved by having proper skin care routine which provide lots and lots of hydration to the skin. The skin care routine must contain active ingredients like retinol, hyaluronic acid, vitamin C, tretinoid which having anti aging / anti wrinkle properties. Use of these ingredients in the 20s of age helps to prevent the appearance of wrinkles and fine lines in the face and body. Also the proper intake of collagen containing and nutritious food helps in anti aging. Hydration is the key factor that reduces the skin wrinkling, both external and internal hydration is important. Proper internal hydration can be achieved by taking 2 - 3 litres of water daily. Proper sleep and stress also triggers skin aging.

Skin wrinkling and fine line appearance can be prevented by :

- ❖ **Healthy Lifestyle Choices:** Leading a healthy lifestyle forms the foundation for age prevention and anti-aging efforts. Regular exercise, a balanced diet rich in nutrients, and adequate hydration are essential components. Physical activity boosts circulation, supports overall well-being, and helps maintain muscle tone. A nutrient-rich diet supplies the body with antioxidants, vitamins, and minerals, which play vital roles in skin health and combating oxidative stress.
- ❖ **Sun Protection:** Protecting the skin from harmful ultraviolet (UV) radiation is paramount in age prevention and anti-aging. Long-term sun exposure contributes significantly to premature aging, including the formation of wrinkles, age spots, and loss of skin elasticity. Practicing sun-safe habits, such as wearing sunscreen

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with broad-spectrum protection, seeking shade during peak hours, and wearing protective clothing, helps shield the skin from UV damage.

- ❖ **Skincare Routine:** Establishing a consistent skincare routine tailored to individual needs is crucial for age prevention and anti-aging. A comprehensive routine typically includes cleansing, exfoliating, moisturizing, and applying targeted treatments. Incorporating products containing antioxidants, retinoids, and hyaluronic acid can help combat free radicals, stimulate collagen production, and maintain skin hydration and elasticity.
- ❖ **Stress Management:** Chronic stress can accelerate the aging process both internally and externally. High levels of stress hormone cortisol can negatively impact skin health, contributing to skin inflammation.

Snail mucin is an important agent which is used to create a skin barrier and also to replenish the skin. It contains several key ingredients that help in skin repairing. It acts as a proper hydrating moisturizer and helps in anti-aging. It contains hyaluronic acid which hydrates the skin and prevents the appearance of fine lines and wrinkles. ^[4]

The snail mucin has several benefits including :

- ◆ **Collagen Stimulation:** Snail mucin contains essential nutrients, including glycoproteins and peptides, that can stimulate collagen production in the skin. Collagen is a protein responsible for maintaining the skin's firmness and elasticity. As we age, collagen production naturally declines, leading to the appearance of wrinkles and fine lines. By promoting collagen synthesis, snail mucin can help improve skin elasticity, reduce the visibility of wrinkles, and promote a more youthful complexion.

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- ◆ **Hydration and Moisture Retention:** One of the key factors in maintaining youthful-looking skin is proper hydration. Snail mucin is renowned for its ability to provide intense hydration and moisture to the skin. It acts as a humectant, attracting and retaining water molecules, which helps to plump and hydrate the skin. Improved hydration can contribute to a smoother skin texture and a reduction in the appearance of fine lines and wrinkles.
- ◆ **Skin Regeneration and Repair:** Snail mucin contains growth factors, hyaluronic acid, and other skin-nourishing components that support skin regeneration and repair processes. These substances aid in the renewal of skin cells, allowing for the replacement of older cells with newer ones. This turnover of cells can help diminish the appearance of fine lines, wrinkles, and age spots, resulting in a more youthful and even-toned complexion.
- ◆ **Antioxidant and Anti-inflammatory Effects:** Snail mucin possesses antioxidant properties, including vitamins A and E, which help combat free radicals, unstable molecules that can damage the skin and accelerate the aging process. By neutralizing free radicals, snail mucin can protect the skin from oxidative stress and minimize the formation of wrinkles and other signs of aging. Additionally, its anti-inflammatory properties can reduce redness, irritation, and inflammation, promoting a calm and rejuvenated complexion.
- ◆ **Enhanced Skin Barrier Function:** A well-functioning skin barrier is crucial in preventing moisture loss and protecting the skin from external aggressors. Snail mucin contains natural ingredients such as allantoin and glycolic acid that contribute to strengthening the skin barrier.

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Snail mucin has garnered attention in the skincare realm due to its potential anti-aging properties. Through collagen stimulation, hydration and moisture retention, skin regeneration and repair, antioxidant and anti-inflammatory effects, and enhanced skin barrier function, snail mucin offers a holistic approach to combat signs of aging. Incorporating snail mucin-infused products into a skincare routine may help individuals achieve a more youthful and revitalized complexion. As with any skincare ingredient, it is advisable to patch test and consult with a dermatologist to ensure suitability for individual skin types and concerns.^[5]



Figure 1. *Achatina fulica*



Figure 2. *Cornu aspersum*



Figure 3. Collection of Snail mucin



Figure 4. Snail farming



Figure 5. Snail mucin in skin care