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TO STUDY ABOUT NATURAL HAIR REVITALIZING LIQUID SPRAY BY USING RICE WATER

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Abstract

Healthy, vibrant hair is often viewed as an indicator of overall well-being, beauty, and effective personal care practices, playing a significant role in shaping one's appearance and confidence. The human hair growth cycle involves four primary phases: anagen (growth), catagen (regression), telogen (resting), and exogen (shedding). Hair pigmentation is provided by melanin produced within hair follicle cells, though, over time, follicles may lose their ability to generate melanin, resulting in grey or white hair. Additionally, damaged follicles can impair hair growth, potentially leading to conditions like alopecia, where hair production ceases altogether.

This study focuses on exploring rice water as a natural agent for promoting hair health and growth. Rice, scientifically identified as Oryza sativa from the Graminae family, has a long-standing history in hair and skincare due to its beneficial properties. The nutrient-dense cuticle layer between the rice grain and husk contains valuable components, including the embryo and endosperm. When rice water is prepared, it becomes rich in essential vitamins, amino acids, and trace minerals, such as zinc, magnesium, and vitamins B and C. These nutrients help to strengthen and protect the hair cuticle, nourish hair follicles, and repair damaged cells, contributing to overall hair vitality. Additionally, rice water's protein content supports hair structure, enhances shine, and promotes a balanced scalp pH. Its gentle, chemical-free cleansing properties make it an ideal natural option for maintaining scalp health.

Overall, rice water offers a comprehensive, natural approach to improving hair resilience and shine, nourishing the scalp, and supporting healthier hair growth, making it a valuable ingredient in hair care formulations.

Keywords: Rice Water, Hair Growth, Hair Strength, Hair Nutrition, Antioxidant Activity, Hair -Treatment, Scalp Health

Introduction

HUMAN HAIR : Human hair is composed of approximately 65–95% protein by weight, alongside 32% water, lipids, pigments, and various other components. The predominant protein in hair is keratin, which constitutes about 80% of its structure and contains a significant amount of sulfur. This composition contributes to the hair's strength, flexibility, durability, and functionality. Keratin forms a complex, laminated structure that imparts resilience and adaptability to the hair.

The physical properties of hair, including its shape, are largely determined by the arrangement of these structural proteins. Hair shape is influenced by the size and form of hair follicles: large follicles produce "terminal" hairs (such as those on the scalp), smaller follicles yield finer "vellus" hairs (such as body hair), and curved follicles result in curly hair across various ethnicities.

STRUCTURE OF HAIR :

Hair Shaft and Root: Each hair consists of a hair shaft, which is the visible part above the skin, and a hair root that extends into the deeper layers of the skin. The hair root is surrounded by a hair follicle, a sheath of skin and connective tissue that connects to a sebaceous gland is shown in Fig no .1

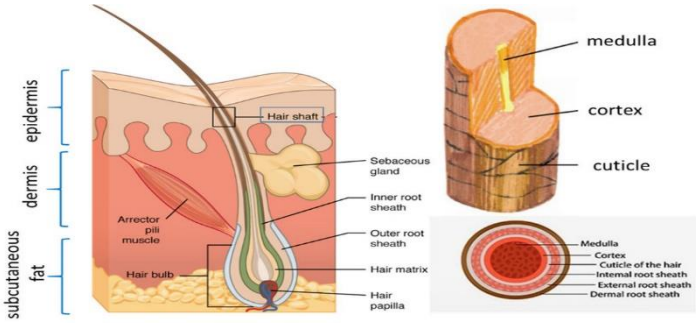

Fig.1

Hair Follicle and Muscle Attachment: Each follicle is attached to a small muscle known as the arrector pili, which can cause the hair to stand upright. Numerous nerves surrounding the follicle can detect even the slightest movement.

Hair Bulb and Papilla: At the base of the hair, the root widens into a bulb shape. The hair papilla, located inside the bulb, supplies blood to the hair root. New hair cells continuously form in the hair bulb, close to the papilla.

Hair Growth: As new cells are generated in the hair bulb, they cluster and harden, creating the hair strand. This strand gradually pushes upward and emerges from the skin. Hair typically grows at an average rate of about 1 cm per month.

Color Determination: The color of the hair is determined by the levels of melanin present in the hardened cells. Melanin production can vary significantly among individuals and tends to decrease with age, leading to a loss of color and resulting in white or gray hair.

Hair Growth Cycle

The hair follicle (HF) in mammals cycles through phases of growth and rest throughout life. The four main phases of the hair growth cycle are ,as shown in Fig no.2

1. Anagen (Growth Phase): This active growth phase begins approximately four weeks after birth. Stem cells in the bulge region of the follicle proliferate to produce a new hair shaft. In humans, the anagen phase can last between 2 to 8 years.

2. Catagen (Regression Phase): This phase marks rapid involution of the hair follicle, lasting about 2-3 weeks. During catagen, the lower two-thirds of the hair follicle degenerates, leaving only a club hair surrounded by an epithelial cap.

3. Telogen (Resting Phase): Following catagen, the telogen phase is a resting stage of the hair cycle, during which shedding may occur. The duration of telogen can increase with age, and hair length varies across body areas due to differences in anagen and telogen duration.

4. Exogen (Shedding Phase): This phase involves the active shedding of hair. Hair follicles cycle independently, with an average distribution of roughly 86% of hairs in anagen, 1% in catagen, and 13% in telogen at any given time.

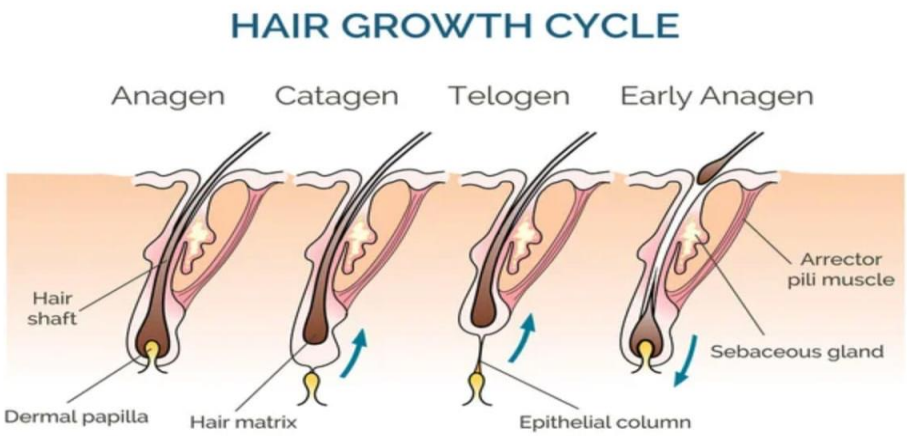

Fig .2

Rice water

Rice water, a starchy liquid derived from soaking or boiling rice, has long been revered as a traditional remedy for promoting hair health. Packed with nutrients such as vitamins B, C, and E, along with essential minerals, rice water is known for its strengthening and revitalizing effects on hair. This natural solution has gained recognition across various cultures due to its positive impact on hair care.

A prominent example is the Chinese village of Huangluo , home to the Red Yao women, who are known for their exceptionally long, glossy, and healthy hair. Recognized in the Guinness World Records as the “world’s longest hair village,” these women attribute their hair’s longevity and vitality to their traditional use of rice water as a natural shampoo and rinse. Their hair remains thick, shiny, and remarkably resistant to graying, often maintaining its color and health well into their eighties. This practice highlights rice water’s role in sustaining hair health, symbolizing good fortune, longevity, and vitality in their culture.

The tradition of using rice water for hair care also spans other countries. Nearly 1,200 years ago, women in Japan’s Imperial Court practiced rinsing their hair with rice water, known as ‘Yu-Su-Ru,’ to keep it strong and lustrous. Similar customs were observed in Korea, Thailand, Cambodia, and Indonesia, where rice water became a staple in hair care routines due to its nourishing qualities.

Rice water is rich in specific components beneficial for hair health. Approximately 16 percent of rice water consists of proteins, essential for cell strength and structure. Triglycerides and lipids make up about 10 percent, aiding in moisture retention and improving hair texture. Starch, often used in Japanese hair products, accounts for roughly 9 percent of rice water’s composition, adding volume and strength to hair strands. Additionally, carbohydrates, inositol, phytic acid, and other inorganic substances contribute to hair resilience and texture.

Traditionally, rice water can be applied as a natural shampoo or used as a final rinse post-shampoo, enhancing the hair’s shine, strength, and overall vitality

History of Rice Water for Hair:

Rice is a staple food known for its high starch content, comprising approximately 75-80% of its grain form. When rice is soaked in water, the starch, along with various beneficial nutrients, is released into the liquid, creating what is commonly referred to as rice water. This nutrient-rich solution contains a range of minerals and vitamins, including amino acids, vitamin B, vitamin E, and antioxidants.

The use of rice water for hair care is not merely a beauty trick passed down through generations; it has garnered attention from researchers as well. A notable study published in 2010 in the Journal of Cosmetic Chemists explored the benefits of rice water for hair, highlighting its potential positive effects.

Historically, during the Heian Period in Japan (794 to 1185 CE), court ladies were renowned for their long, luxurious hair that often reached the floor. These women reportedly incorporated rice water into their daily hair care routines to maintain their hair’s beauty and health.

In China, the women of the Red Yao tribe in Huangpu village, known as the "Land of Rapunzel," have similarly embraced rice water for their hair. This village is recognized by the Guinness World Records as the “world’s longest hair village,” with women boasting an average hair length of six feet. Remarkably, the Yao women’s hair retains its color well into their eighties, further attesting to the benefits of using rice water.

Research from the 2010 study indicated that rice water reduces surface friction and enhances hair elasticity. Additionally, a Japanese research facility is investigating imaging techniques to visualize the strengthening effects of inositol, a key component found in rice water, on hair health.

With such a rich history and scientific backing, it is evident that rice water offers significant benefits for hair care, making it a valuable addition to beauty rituals.

Description of Rice Water

Rice water is the starchy liquid left behind after rice has been cooked or soaked. It is believed to enhance hair smoothness and shine while promoting faster hair growth. Rice grains consist of approximately 75-80% starch, and rice water is thought to retain many of the vitamins and minerals found in rice.

Plant :

Botanical Name*: Oryza sativa.linn*

Biological Source: Consists of the embryo and endosperm of the seeds of Oryza sativ

Family: Graminae (Poaceae)

Scientific Classification

Kingdom : Plantae (plants)

Subkingdom : Viridiplantae (green plants)

Superdivision : Embryophyta

Division : Tracheophyta (vascular plants)

Subdivision : Spermatophytina (seed plants)

Class : Magnoliopsida

Family : Poaceae (grasses)

Genus : Oryza L. (rice)

Species : Oryza sativa L. (rice)

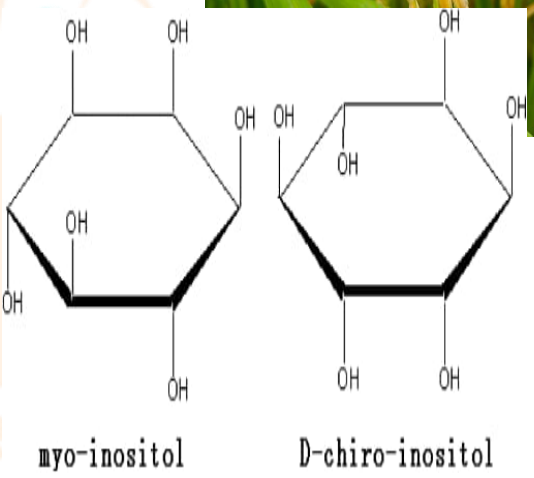

Fig .3

Chemical Constituents :

Rice grains contain the following composition:

Water: 12%

Carbohydrates (inositdal): 75-80%

Protein: 7%

Fat: 3%

Fiber: 3%

Pharmacological Properties

Rice water exhibits various beneficial properties, including: Fig no.4

Antioxidant ,Anti-colitis ,Anticancer ,Antitumor, Anti-mutagenic, Antidiabetic, Ocular impairment, Anti-aging, Anti-inflammatory

Additionally, rice water is rich in vitamins B, C, and E, as well as essential minerals that promote skin cell growth and stimulate blood circulation.

Materials and methods

Formulation of Rice Water for Hair Growth

Rice water can be prepared using various methods, including soaking, boiling, and fermentation. Each method has its own advantages, allowing users to choose based on their preferences and available time.

1. Soaking Method

Ingredients: ½ cup uncooked rice (any variety) and 2-3 cups of clean water.

Procedure:

- Rinse the uncooked rice under running water to eliminate any impurities.
- Place the washed rice in a bowl and add 2-3 cups of clean water.
- Cover the bowl and let it sit for 15 to 20 minutes.
- After soaking, gently knead the rice to help release nutrients into the water, which will turn cloudy
- Strain the rice, pouring the nutrient-rich water into another bowl for use

2. Boiling Method

Ingredients: 1 cup of rice and water for cooking.

Procedure:

- In a cooking pot, add the uncooked rice and sufficient water for cooking.
- Add an additional cup of water to ensure extra nutrient extraction.
- Cook the rice until it is fully done, then strain out any excess water into a separate bowl.
- The strained water will contain the beneficial nutrients from the rice.

3. Fermentation Method

Ingredients: Rice as used in the soaking method.

Procedure:

- Prepare the rice as described in the soaking method and strain out the rice.

- Transfer the remaining water into a closed glass jar and leave it at room temperature.

- Allow the water to ferment until it develops a sour smell, indicating potency.

- Once fermented, store the rice water in the refrigerator for later use.

Conclusion

In this study, we explored the various benefits of rice water for hair health. We produced rice water using different methods, and the rice water obtained after boiling demonstrated in vitro biological antioxidant activity comparable to that of ascorbic acid, along with significant elastase inhibition activity. Incorporating rice water into hair cosmetic formulations such as masks, shampoos, and conditioners resulted in the development of a semisolid dosage form suitable for hair application, exhibiting favorable cosmetic properties.

Rice water has been shown to enhance hair quality, making it shinier, healthier, and fuller while providing detangling, smoothing, and strengthening benefits. Additionally, it is effective in treating dandruff and repairing damage caused by hair tools. Given these advantages, there is significant scope for further research in this area to better understand rice water's applications in haircare products.

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