


Research article

A review literature on rice water for hair mask

Anita A Najan*, Vaishnavi R Dhone, Pratiksha V Wankhede, Londhe P Pradnya

Dnyansadhana college of pharmacy, Dharmapuri, Parbhani, Maharashtra, India

Corresponding author: Anita A Najan, ✉ anitanajan271@gmail.com, **Orcid Id:** <https://orcid.org/0009-0005-7618-4445>

© The author(s). This is an open access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by-nc/4.0/>). See <https://ijtinovation.com/reprints-and-permissions> for full terms and conditions.

Received - 27-09-2025, Revised - 28-08-2025, Accepted - 18-09-2025 (DD-MM-YYYY)

Refer this article

Anita A Najan, Vaishnavi R Dhone, Pratiksha V Wankhede, Londhe P Pradnya, A review of the literature on rice water for hair mask. International Journal of Therapeutic Innovation, November-December 2025, V3 – I6, Pages - 17 – 23. Doi: <https://doi.org/10.55522/ijti.v3i6.0135>.

ABSTRACT

The project Formulation and Evaluation of herbal hair mask aims to develop an effective hair mask using natural ingredients to improve hair health and address common hair issues such as dryness, damage, and hair scalp problems Hair care is a vital aspect of personal hygiene and self- presentation, yet many individuals face issues such as dandruff, hair fall, dryness due to stress, hormonal imbalance, poor nutrition, and the frequent use of chemical- based products. In response, this project presents the development of an herbal hair mask formulated entirely from natural ingredients. the mask incorporates traditional ayurvedic components including rice water, aloe vera gel, rose water, lavender oil, coconut oil, milk protein, etc. the mask also incorporates milk protein for nourishment, vitamin E for antioxidants protection, rosemary oil for stimulating hair growth, coconut oil for deep conditioning, aloe vera gel for soothing and moisturizing, rose water for its hydrating aromatic properties The formulation process involves precise blending of these ingredients to achieve consistent and effective hair mask .evaluation include phytochemical analysis to identify the active components. The mask demonstrates excellent moisturising, strengthening, and protective properties, making it suitable for regular use to maintain healthy, shiny, and resilient hair.

Keywords: Rice water, Hair mask, Natural ingredients, Hair health, Antioxidant protection, Rosemary oil.

INTRODUCTION

Hair cosmetics can be characterised as preparations intended for cleaning, altering the texture, changing the colour, revitalising stressed hair, nourishing the hair, and giving the hair a healthy appearance. Different people have different types of hair, including dry, oily, and normal. People these days don't have time to consider their physical appearance. issues with hair, split ends, dandruff, white hair, hair falling out, etc., stress, scalp infections, hormonal imbalance, insufficient vitamins, food and mineral intake, and excessive use of shampoos are the causes of hair problems. Nowadays, one of the most crucial aspects of one's personal life is having a clean scalp and hair. The most vital component of the body is hair. Thus, to care for them, we developed a hair mask recipe. The benefits of the components used in the herbal hair mask for hair are known. The purpose of using a hair mask is to cleanse the hair of accumulated debris. Chemicals are not used in a herbal hair mask. It doesn't damage our hair because it solely contains natural components. Hair is a sensitive organ and a sign of good health. We can assist in hydrating our hair by using an herbal hair mask. They

are very helpful for damaged and dry hair. A hair mask can improve the strength of our hair and the condition of our scalp. These hair masks are quite helpful to our hair, with no negative effects, and are also manufactured at home ^[1-2].

Types of herbal hair mask

For dry hair: Avocado, honey, and olive oil mask.

For frizzy hair: castor oil mask.

For hair growth: rosemary and castor Oil mask.

For curly hair: rice and avocado mask.

For thin hair: banana, honey, egg, and olive Oil mask.

History

The tradition of using rice water as a beauty regimen is believed to trace back to ancient China, particularly during the Tang dynasty (618-907 AD). For centuries, rice water has been revered for its cosmetic benefits. In ancient times, preceding the Qin dynasty, individuals would cleanse their hair and body with rice water, enriched with starch, proteins, and vitamins. (1,2) Beyond its cleansing properties for hair and skin maintenance, rice water was valued for its potential to soften rough skin and offer medicinal

relief. It was known all alleviate conditions such as cold extremities, lower back discomfort, frostbite, and fatigue. Essentially, this natural cosmetic served as a multipurpose product, functioning as a shampoo, body wash [3].

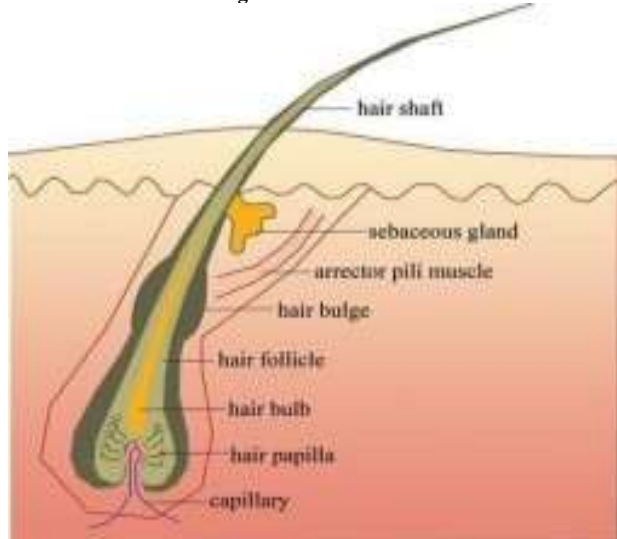
Structure of hair

Hair is mainly divided into two parts

Hair root

Hair shaft

Figure 1: Structure of hair



Hair shaft

Cuticle

The outermost layer is made of overlapping, flat cells. It protects the inner layers.

Cortex

The thickest layer, containing keratin and melanin (which gives hair its colour). It provides strength and flexibility.

Medulla

The innermost layer (sometimes absent in fine and light-coloured hair). Its functions are not entirely clear

Hair roots/hair follicle

This is the living part of hair located below the surface:

Hair bulb

The base of the follicle, where hair cells divide and grow.

Dermal papilla: Provides nutrients and signals for hair growth.

Sebaceous gland: Produces sebum (oil) that lubricates the hair and scalp.

Arrector pili muscle

Causes hair to stand up when it contracts (eg, goosebumps).

Hair growth cycle: Hair grows in phases

Anagen: Active growth (2-7 years)

Catagen: Transitional phase (2-3 years)

Telogen: Resting phase (about 3 months), after which the hair falls out.

Problems related to hair

Damaged hair from heat styling, colour treatments, or the environment

Oily scalp

Dandruff

Discoloured hair

Hair masks are thicker than conditioners and penetrate deeper into the hair shaft. They contain natural oils, butters, and plant extracts [5].

A hair mask can do: including

Repairing damage: A hair mask can help repair damaged hair, making hair stronger and less prone to breakage and split ends.

Hydrating: A hair mask can help add moisture and hydration to hair, which is essential for healthy hair.

Reducing frizz: A hair mask can help to reduce frizz and static, making hair smoother and shinier.

Protecting hair: A hair mask can create a protective barrier around hair to shield it from environmental damage like pollution, UV rays, and heat styling. Improving scalp health: Some hair masks can help soothe an irritated scalp and remove dandruff.

Stimulating hair growth: A hair mask can contain ingredients that promote hair growth

Making detangling easier: a hair mask can make hair smoother and silkier, making it easier to detangle after washing.

TO maximise the benefits of a hair mask, you can apply it to clean hair, divide your hair into sections, and comb the mask through.

Key benefits of rice hair mask

Moisturising: a natural hair mask can deeply moisturise and nourish the hair, preventing dryness and breakage. This is particularly beneficial for those with dry, brittle, or damaged hair.

Strengthening: Many natural ingredients used in hair masks, such as rice water and milk protein, contain proteins that strengthen hair strands, reducing breakage and promoting healthy hair growth.

Repairing: a natural hair mask can help to repair and restore the damaged hair. for example, ingredients like rose water can repair split ends and enhance overall hair health.

Soothing: certain natural ingredients, such as aloe Vera gel, have soothing properties that can reduce scalp irritation and inflammation.

Detoxifying: a natural hair mask can remove buildup and impurities from the hair and scalp, improving overall hair health and promoting a healthy scalp.

Enhancing shine: Some natural ingredients in hair masks can enhance the hair's natural shine, leaving it looking healthy and vibrant [4].

Advantages of rice water hair mask

Rice water hair mask has been used for centuries, especially in East Asian beauty practices. Here are some main advantages.

Rice water is rich in amino acids and vitamins (like B and E) that help strengthen hair strands and reduce breakage.

Inositol, a carbohydrate found in rice water, helps stimulate hair growth and repair damaged hair.

It smoothens the hair cuticle, giving your hair a natural shine and silky texture.

The starch in rice water can coat the hair shaft, making it easier to comb and reducing tangles.

It can calm irritation and reduce dandruff, especially if your scalp is sensitive or itchy.

It helps to maintain a healthy scalp environment, which is key to healthy hair.

Disadvantages of rice water hair mask

Yes, while rice water hair mask can be beneficial, it can also have some disadvantages, especially if overused or used incorrectly: Rice water is rich in protein. If your hair doesn't need extra protein, using too much makes your hair dry, stiff, or brittle. Frequent use can cause starch or protein buildup, which can clog the scalp and weigh hair down.

If you already have dry or low porosity hair, rice water can make it even drier and harder to manage.

Fermented rice water can smell sour or off if not stored properly. Some people with sensitive skin might experience itchiness or flaking after using it.

Coarse, low porosity or protein-sensitive hair types may not respond well to rice water treatment

Aim and objective

Aim: Formulation and Evaluation of herbal rice water hair mask (4,5)

Objective

To develop a stable and effective hair mask formulation using rice water and other complementary natural ingredients.

To evaluate the physicochemical properties (pH, viscosity, texture, and stability) of the formulated hair mask.

To assess the hair conditioning effects of the rice water hair mask through sensory analysis and instrumental testing.

To determine the efficacy of the hair mask in reducing hair fall, improving shine, and enhancing hair strength through user trials and laboratory evaluations.

To compare the performance of the formulated rice water hair mask with a commercially available standard hair care product.

Drug profile

Rice water

Synonyms: kanji, starch water Family: Phocaea

Biological Source: Rice itself, specifically the embryo and endosperm of the seeds of *Oryza sativa* and *Oryza glaberrima*. It is the starchy water that remains after soaking or cooking rice.

Chemical constituents

Carbohydrate: Starch (amylose and amylopectin)

Proteins: Amino acids like glutamic acid

Vitamins: B-complex vitamins, vitamin E

Minerals: magnesium, calcium, potassium

Properties: the amino acids in rice water help repair and strengthen.

It provides energy and can act as a soothing agent.

Regular use can make hair silkier.

Milk protein

Synonyms: Dairy, lacteal secretion,

Family: This depends upon the source animal. cow - family - Bovidae

Buffalo -family -Bovidae

Biological Source: Milk is the natural secretion from the Mammary glands of mammals.

Figure 1: Rice water



Milk is a complex emulsion of fat in water containing protein (3.2 -3.5%) casein (80%)

Lactose (2-8%)

Vitamin

Contains all essential oils

Easily digestible

Ability to stabilise fat-in-water emulsion

Important in products like whipped cream

Used in cheese and yoghurt production

Enhance the structure of the food product.

Figure 2: Milk protein



Vitamin E

Synonyms: Tocopherol

Family: Vitamin E is a part of the tocopherol family of fat-soluble Vitamins

Biological source: Vitamin E is primarily obtained from plants

Vegetable oil, nuts and seeds, leafy green vegetables, fruits, Tocopherols and Tocotrienols

Properties

Vitamin E is a potent antioxidant, which means it helps protect cells from oxidative stress by neutralising free radicals.

Being fat-soluble, vitamin E is absorbed in the intestine along with dietary Fats and stored in adipose tissue and the liver. It requires bile salt and pancreatic enzymes for absorption

Vitamin E exhibits anti-inflammatory properties, which can be beneficial in treating conditions like arthritis or skin irritation. It is widely used in skincare due to its ability to protect the skin from UV damage and improve skin elasticity and hydration.

It plays a role in enhancing immune response, especially in older adults, by improving the production of immune cells.

Figure 3: Vitamin E capsule



Rosemary oil

Synonyms: Rosmarinus oil,

Spanish sage oil Family: Lamiaceae

Biological source: Rosemary oil is derived from leaves of *Rosmarinus Officinalis*, a woody herb native to the Mediterranean Region. It belongs to the mint family.

Chemical constituents: Rosemary essential oil contains several bioactive Compounds, including:

Eucalyptus: known for its respiratory Benefits.

Alpha-pinene: Has anti-inflammatory and memory-enhancing properties. Camphor: offers analgesic and anti-inflammatory Properties: protect cells from oxidative damage.

Reduce inflammation and help with pain relief. - Fights infections and supports wound healing. may improve memory and focus.

Tightens and tones of skin.

Coconut oil

Synonyms: Copra oil,

Figure 4: Rosemary Oil



Cocos nucifera oil, Coconut butter.

Family: Arecaceae

Biological source: Coconut oil is extracted from the mature seeds of the Coconut palm tree.

Chemical constituents: Saturated Fatty acids: Lauric acid (C12)

Monounsaturated fatty acids: oleic acid (C18:1) 3) Polyunsaturated fatty acids: linoleic acid (C18:2)

Other compounds: vitamin E,

Properties: It has a mild coconut aroma.

Colour is pale yellow when it is liquid.

High melting point about 24-25 c.

Rich in medium-chain triglycerides.

Antimicrobial and antifungal properties.

Often used in skincare due to its emollient nature.

Help to reduce inflammation in both topical.

Figure 5: Coconut oil



Rose water

Synonyms: Gulab jal

Family: Rosaceae

Biological source: rose water is obtained from the distillation of rose Petals, typically of the damask or cabbage rose species. The flowers are steam-distilled to extract the essential Oils and water-soluble compounds.

Chemical constituents: Phenolic compounds: these include flavonoids. Essential oils: Vitamins: vitamin C and vitamin A Organic acids: citric acid and malic acid

Properties. Rose water has a pleasant, floral aroma, due to its Essential oil contents 2) Rose water has antioxidant properties, helping to fight Free radicals and reduce oxidative stress.3) It is known to calm inflammation and reduce redness and irritation, particularly in skin applications.4) Its cooling effects make it a popular ingredient in Skincare products for calming the skin.5) helps to maintain moisture levels on the skin, often used in facial toners 6) Rose water has mild astringent properties, which can help tighten the skin and reduce excess Oils.

The fragrance of rose water is used for relaxation, reducing stress, or improving mood.

Figure 6: Rose water



Aloe vera gel

Synonyms: Aloe barbadensis gel, aloe juice.

Family: Asphodelaceae

Biological source: Aloe vera gel is the mucilaginous extract obtained from the parenchymatous tissues in the inner Portion of the leaves of Aloe barbadensis mill. Chemical constituents: polysaccharides: glucomannan. Enzymes: Amylase, catalase

Properties

- Anti-inflammatory
- Anti-oxidants
- Wound healing
- Moisturising and skin-soothing
- Anti-bacterial and antifungal

Figure 7: Aloe vera gel



Hibiscus powder

Synonyms: Hibiscus rose-sinensis, China rose.

Family: Mallovs

Biological source: It is a flowering plant native to East Asia, widely cultivated in Tropical and subtropical regions. The dried flowers and leaves

They are commonly used for medicinal and cosmetic purposes. Chemical constituents: flavonoids: hibiscetin. Mucilage: polysaccharides with demulcent properties. Phenolic acid: citric acid, malic acid

Organic acids: tartaric acid

Others: saponins, tannins, amino a.. Properties:

- Antioxidants
- Antibacterial and antifungal
- Anti-inflammatory
- Antihypertensive
- Emollients used in hair and skin care
- Menstrual regulator - Wound healing
- Mild laxative
- Used as a natural hair dye and conditioner

Figure 8: Hibiscus powder



Amla Powder

Synonyms: Indian gooseberry

Family: Phyllanthaceae

Biological source: dried fruit or powder of Phyllanthus emblica Linn
Chemical constituents: vitamin C, Tannins, flavonoids, Phenolic compounds, Alkaloids, amino acids, pectin, carbohydrates.

Properties

- Antioxidants: due to high vitamin C and tannins
- Immunomodulatory
- Anti-inflammatory
- Hepatoprotective —protects the liver
- Antimicrobial
- Digestive aid- promote gut health
- Anti-ageing- helps prevent oxidative stress
- Hair tonic- strengthens roots and prevents premature greying.

Figure 9: Amla powder



Materials

Table 1: Formulation of herbal hair mask

Name of Ingredient	Supplier / Gifted by
Rice	General store / Market
Milk protein	Home
Vitamin E	Medical
Rosemary oil	Market
Coconut oil	Market
Rose water	Market
Aloe vera gel	Market
Hibiscus powder	Market
Amla powder	Market

Organoleptic properties

It involves macroscopic aspects of the herbal ingredients such.

Physiochemical properties

The pH method: measured by using a digital pH meter.
The 1 g powder was dissolved in 100ml of distilled water and be sure that all the powder is mixed in distilled water. Then, by using a calibrated pH meter measured the pH value was measured and reported.

Solubility

Solubility of a substance refers to the amount of substance that passes to the solution to achieve a saturated solution at a constant temperature and pressure. 1 g of solution or substance was weighed accurately and transferred into a beaker containing 100 ml of water. This was shaken well and warmed to increase the solubility, then cooled and filtered. The residue obtained is weighed and noted.

Weighing of ingredients

All the required ingredients for hair mask preparation were weighed [6].

Mixing of ingredients

Added the rice to the water.

Boil this water for around 10 minutes and keep stirring to avoid the rice from sticking to the base of the utensil

Let the gel cool down for about an hour while it thickens.

Put the muslin cloth in a glass measuring cup, and then empty the gel into it.

Now squeezed the gel from the muslin cloth into the measuring cup to strain

Add the milk protein.

Stir the giving product until smooth and completely.

Keep stirring the liquid will change its consistency after few minutes and start to become more viscus but want to get the thickness as required because it after only after cooling.

Stirred until it changed from a milky white into a Vaseline-like colour and texture.

After that, hibiscus flowers are dried in a hot air oven and cooled at room temperature make a fine powder of the ingredients with the help of mortar and pestle.

Mix the above hibiscus powder and made a paste of it then add amla powder and Multani powder in it and mix well.

Added the rose water and aloe vera gel to the above paste.

Then added coconut oil and rosemary oil and made a uniform paste.

Finally added sodium benzoate as a preservative [7,8].

Summery

The study focuses on the formulation and evaluation of a herbal rice-water-based hair mask using natural ingredients such as rice water, aloe vera gel, milk protein, coconut oil, rose water, vitamin E, hibiscus, amla, and rosemary oil. These components were selected due to their traditional and scientifically supported benefits in enhancing hair strength, moisture retention, scalp health, and shine. Rice water, rich in amino acids, vitamins (B & E), and inositol, serves as the primary active agent providing strengthening, smoothing, and hair-growth-promoting effects. Complementary botanicals add additional antioxidant, anti-inflammatory, nourishing, and conditioning properties. The formulation process involved the extraction of rice water, the incorporation of herbal powders and oils, and the evaluation of physiochemical parameters such as pH, solubility, viscosity, and texture. The prepared hair mask demonstrated good spreadability, stability, natural fragrance, and superior moisturizing and strengthening effects, suggesting its suitability for routine hair-care applications [9,10].

This herbal mask offers a safer, mild, and chemical-free alternative to synthetic hair-care formulations, especially for individuals suffering from hair fall, dryness, dandruff, scalp irritation, and dullness. [11-12].

CONCLUSION

The prepared rice water herbal hair mask proved to be effective in improving overall hair quality due to its rich phytochemical and nutrient composition. The combination of rice

water with other natural ingredients enhanced hair hydration, increased shine, reduced breakage, nourished hair roots, and supported scalp health. Evaluation studies indicate the formulation is stable, safe, and user-friendly for regular application without harmful side effects. This study supports the growing preference for herbal hair-care systems, demonstrating that rice-water-based formulations can serve as efficient and affordable natural alternatives to commercial chemical-based hair products. Further clinical studies with larger sample sizes can be conducted to validate long-term efficacy and standardize formulation parameters for potential commercialization.

REFERENCES

1. Jujgar G S, Kale P B., Jagdale V H, et al, 2024. Formulation and evaluation of herbal hair mask. *Journal of Pharmacognosy & Phytochemistry*. 13(3), Pages 51-59. Doi: 10.22271/phyto.2024.v13.i3b.14945.
2. Amolik A B, Somani S J, Sherkar M R, Formulation and evaluation of Aloe vera herbal hair mask using fenugreek seeds. *Journal of Pharmacognosy & Phytochemistry*. 14(1), Pages 54-62. Doi: 10.22271/phyto.2025.v14.i1a.15220.
3. Dhokne P D, Chaple D R, Rane S V, et al, 2025. Formulation and evaluation of rice water hair mask. *IJIRT*. 11(10), Pages 898-902.
4. Kasar T M, Mahale C B, Mahale S D, et al, 2024. Natural nourishment: formulation and evaluation of herbal hair mask. *JETIR*. 11(5), Pages 408-417.
5. Jaiswar E, Supekar N, Sarode S, et al, 2024. Formulation and evaluation of polyherbal hair mask. *IJARST*. 4(1), Pages 387-398.
6. Bhanu M D Sajila, Sri Rama Krishna H, Sai Kumar S, et al, 2024. Formulation and evaluation of a herbal hair mask containing linum usitatissimum. *World Journal of Pharmaceutical Research*. 13(5), Pages 945-955. Doi: 10.20959/wjpr20245-31505.
7. Jadhav A P, Wakale M T, Telangi G M, et al, 2022. Formulation and evaluation of herbal anti-dandruff hair mask. *International Journal of Scientific Research in Science & Technology*. 9(3), Pages 556-564.
8. Kolhe S, Indore P, Shewale S, et al, 2019. Formulation and evaluation of polyherbal hair oil for alopecia. *Journal of Drug Delivery & Therapeutics*. 9(2-s), 387-390. Doi: 10.22270/jddt.v9i2-s.2552.
9. Soundaryashree N R, R S Chandan, Venkata Ramana Singamaneni, et al, 2025. Development and alidation of RP-HPLC Method for Quantification of Bamifylline in Pharmaceutical Formulations using Analytical Quality by Design (AQbD) Principles. *Advanced Journal of Chemistry*. Section A. Pages 2076-2097. Doi: <https://doi.org/10.48309/ajca.2025.526997.1859>.
10. Rajesh D Ahire, Rakesh S Dhole, Purushottam S Marathe, et al, 2024. Impact of Food Nutrient in the IBD Management and Prevention. *International Journal of Therapeutic Innovation*. Pages 0085 – 0088. Doi: <https://doi.org/10.55522/ijti.V211.0020>.

11. Teli S, Shah TM. Design Solid Lipid Nanoparticle Solid lipid nanoparticle (SLNs) of Dapagliflozin for Enhanced Oral Bioavailability and Controlled Release in Type 2 Diabetes.
12. Darji P, Patel J, Patel B, et al, 2024. A comprehensive review on anticancer natural drugs. World J. Pharm. Pharm. Sci. 13, Pages 717-34. Doi:10.20959/wjpps20244-27049.