

**A REVIEW COMPREHENSIVE ON THE FORMULATION AND EVALUATION OF PROTEIN-BASED KIDNEY BEAN CONDITIONER****Khushi Gupta\*, Piyush Pankaj**Department of Pharmaceutics, Sardar Patel College of Pharmacy, Medical Collage Road,  
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273013 [U.P.] India.[khushygupta29@gmail.com](mailto:khushygupta29@gmail.com)**How to cite this Article:** Khushi Gupta\*, Piyush Pankaj (2026). A Review Comprehensive On The Formulation And Evaluation Of Protein-Based Kidney Bean Conditioner. World Journal of Pharmaceutical Research, 15(8), 1284-1294. This work is licensed under Creative Commons Attribution 4.0 International license.**ABSTRACT**

Herbal Hair care rolls as a common use in our life as per daily routine for best human service. Herbal formulations are naturally accepted by us due to their affordable price and common side effects. Basically, many herbal products like hair creams are preferred in our hair cream routine because of its softness and ease of application in our hair. Our focus in this review is to give an overview of how our herbal hair cream is formulated and evaluated along with all the ingredients used in making our hair cream like kidney beans (*Phaseolus vulgaris*), aloe vera and a mixture of vitamin E and sodium benzoate. Herbal moisturizer and hair cleanser. In recent years, researchers have been looking for ways of making herbal hair creams for both the treatment and maintenance of a healthy scalp. Instead of relying only on traditional mixing approaches, current studies focus on advanced techniques, such as nanoemulsions, liposomes and microgels. Amla, Bhringraj and

Aloe vera penetrate to the deeper layers of the scalp and stay active longer. Recent studies use computer-aided optimization to identify the best ratio of oils, herbal extracts and emulsifiers. This way, the cream is easier to apply and has a longer shelf life. Some of the tests done today include texture, viscosity and skin compatibility which is key for quality product. Novel herbal hair products contain traditional values with contemporary scientific ideas to produce safe and effective formulations techniques. To keep the process natural, scientists are also switching to eco-friendly techniques of extracting nutrients from herbs which include ultrasound assisted and microwave-based methods. A Naturally emulsifiers and thickeners as

lecithin, beeswax and plant-derived gums are employed to improve the texture and stability of Herbal products. We know Albumins work as hair repair system this process formulation and evaluation of kidney bean extract, direct used as 'Novel Drug Formulation' Protein-based herbal hair conditioners acts with Kidney bean extract, Aloe Vera, Tocopherol acetate, Sodium Benzoate as a preservative agent, Aloe vera used in this formulation for moisturizer and soothing reagent, and Tocopherol acetate provides antioxidant properties. Kidney bean provide high protein source and rich in essential amino acids and also exhibit antioxidant properties. and lysin, leucine and arginine, Polysaccharides, vitamins, Phenolic Compounds & Flavonoids, Globulins & Albumins. Cosmeceutical application in this formulation have rheological profiling in oxidative on synergistic process, and emulsion-based oil-in-water formulation, constituents the hair stability parameters such as pH determination, viscosity of texture, spreadability, and irritation assessment ensure the safety, efficacy, and derma compatibility, used in all process on the calibration and validation process. This formulation provided 'Novel herbal nano cream matrix' combines traditional herbal formulation and evaluation process with modern Pharmaceutical Science. This is a very safe and effective formulation; it will be very useful in our busy life schedule. As we are busy and Cannot care to our hair in less time, this formulation helps us a lot and our hair becomes soft and shiny very quickly.

**KEYWORDS:** Herbal hair-care formulation, protein-rich kidney bean conditioners, Novel herbal nano cream matrix, kidney bean antioxidant-rich moisturizing cream, protein based herbal hair conditioner, Herbal keratin booster, hair care based amino- antioxidant formulation, Natural conditioner bioactive formulation, scalp soothing innovation, Phyto-protein repair conditioner cream, herbal blend enriched kidney bean extract , Natural silicone - free conditioner.

## INTRODUCTION

Herbal hair conditioners are garnering attention as safe alternatives to chemical formulations. Their hair repair technology targets to improve hair texture, smoothness and moisture retention by using plant-derived proteins, polysaccharides and antioxidants.



To achieve this, modern research advocates the use of nutrient-rich herbal actives like Aloe vera, Fenugreek seeds, Hibiscus petals, Amla oil and Vitamin E for product formulations such as cream or hair conditioner.

### **Kidney Bean Extract + Aloe Vera + Vitamin E fits the trends perfectly**

#### **Kidney Bean (Rajma)**

This Kidney bean extract as herbal conditioner formulating Natural smoothing agent We know Kidney bean (*Phaseolus Vulgaris*) are higher protein source based on nutrient- rich, essential amino acids, and antioxidants, to use on scalp cause for.

- Dry & rough
- Breakage
- Thick hair
- Dull hair
- Tangled hair
- Tangling Hair root
- Brittleness
- Fizziness
- Lack of shine or Luster

Taking care of our hair has become a modern necessity. With time, we have come across many new products that are very comfortable for our hair. Some chemical products, some natural. Of these, we found a natural formulation that is completely herbal based to be the best for the good care of our hair. Keeping in mind the needs of our hair, we needed a product that gives good results when applied 2 to 3 times weekly. Keeping in mind the common problems of our hair like roughness, hardness, tangles, this herbal hair care cream has been made, if seen from the past time, the demand for natural things like herbal and natural is increasing because it is very easy to apply on hair and works without any side effects. It has very good results on our hair. We are increasingly becoming aware about the possible side effects of synthetic surfactants, silicon, paraben and synthetic fragrances. On the other hand, herbal formula is much safer. It is biodegradable and can be used as a cosmetic in our hair. Natural cosmetic Herbal contains herbal ingredients like plant based.

#### **Need for herbal hair cream formulation -**

To make the hair cream we use a semi solid emulsion made from oil in water. It provides moisture and protection to dry hair and prevents hair damage. This traditional cream

ingredients synthetic moisturizing agent. It provides temporary protection. It is used weekly. It ultimately removes live residue and script. You can use its natural ingredients; this herbal hair cream is truly plant based and is the best ingredient used in this herbal hair cream. It is a true and natural antioxidant Which nourish hair from root herbal medicine technology confirms its effective herbal ingredients which are standardized and certified and have reproducible cosmetic effects compared to synthetic counterparts. Therefore, in this multi-functional hair care cream we combine traditional medicinal knowledge with new formulation science. This company uses red kidney bean extract and Aloe Vera. Gel Vitamin E sodium benzoate This single formula represents a Nobel approach in moisturizing and protecting hair This ingredient all play a significant role and contribute to the overall effectiveness of the product.

### **Aloe Vera**

Aloe vera has been used for centuries for its healing and moisturizing properties. It contains vitamins A, E, and B12. It acts as an enzyme and moisturizer, improving moisturizer retention and protecting hair from irritation. We Added the hair cream ingredients to maintain the protection of UV rays and pollution this product provided smoothness, in 2023 (Ivysci) studies on aloe vera it totally binds with vitamin E to combine moisturizing and antioxidant as a emulsions form.

### **Tocopherol Acetate**

We know about Vitamin E that it is a fat-soluble antioxidant. It protects the scalp and hair follicles present in our cells, brain and improves the oxidative stress. It promotes blood circulation in our scalp and our hair growth. We use it in making hair creams. As an antioxidant, this vitamin enhances the stability and life of our hair and is very effective in making the hair soft. It makes the hair silky soft and removes the polluted roughness present in the hair.

### **Sodium benzoate**

Now let us talk about sodium benzoate, it is commonly used as a preservative, we use it here in cosmetics, it prevents the ingredients present in our product, whatever ingredients are there, from getting spoiled, we use sodium benzoate to prevent bacterial fungi and microbes in this, it is a very good way in this formulation, which makes our product usable for a long time, it does not spoil quickly, it is very useful here.

### **Formulation Approach**

Whatever is involved in the formulation of hair cream from pharmaceutical perspective, we institute water in oil emulsion and its application in appropriate consistency and homogeneity. Its oil phase likely contains fatty alcohols, such as cetyle alcohol or stearic acid, which act as a thickening agent.

Its aqueous phase contains plant extracts and humectants, such as glycerin and a preservative. Creative that homogeneous on controlled temperature as per results with fine and smooth emulsion in desirable rheological properties, PH ensure that comfort of hair for harmful effects.

### **OBJECTIVE OF THE REVIEW**

This review seeks to compile information regarding the formulation techniques and assessment methods for herbal hair creams, emphasizing the efficacy of red kidney bean extract, aloe vera, and vitamin E as moisturizing agents. In this research in chemical quantity are very low amount, there formulation totally based natural ingredients. Their research and practice in this review of object to provide scientific research as a provide safe, effective and sustainable hair cream, In this we see that the approach is aligned with the global trend of green cosmetics and sustainable formulation. In this we have introduced natural plant-based materials with modern pharmaceutical technology in a novel way. In this we enhance the performance of the product and we come to support environmental balance by reducing the chemical. Whatever chemical things are there, we have removed them. We have put all the things in herbal way and by presenting them in FIR hair cream, we make a good product as an ingredient which is proven good as per research.

### **FORMULATION METHODOLOGY**

#### **Kiruthiga S. et al. (2024) – WJPR**

Formulation: Herbal Hair Conditioner Formulation type: Amla, Brahmi, Aloe vera and Shikakai extracts Natural emulsification system - Optimal skin pH 5.8–6.2 - Long-term stability " Aloe vera increases softness and scalp hydration".

**Method-** The formulation aqueous phase and oil phases w aqueous phase, mixed with a magnetic stirrer to obtain an emulsion. The extracts were incorporated while cooling (below 40 °C) to ensure the phytochemicals remained active (Hot Emulsification Method used).

**Gosiya A. (2025) – formulation Herbal Hair Conditioner**

Formulation: Amla, Neem, Fenugreek, Hibiscus and Aloe. Moisturizing period, pH, pollution dispersion and sensory evaluation. "Aloe vera is good moisturizing formula and conditioner for the scalp, especially when used in combination with other nourishing ingredients like vitamin E".

**Method** - emulsification method employed the Extracts were infused in the aqueous phases while oils were in the lipid phase. After homogenization, the cooling ingredients (Vitamin E, fragrance) were added at a temperature lower than 40°C. (Hot- Cold Emulsification method).

**Meghraj A. In Patil et al. Polyherbal Hair Conditioner (2019)**

Formulation: Garden cress natural mucilage as a thickener. perfect detangling, moistures lock and pH compatible. "The formulation including plant proteins and mucilage for improved smoothness, manageability".

**Method-** Mucilage obtained from the seeds of Garden cress was combined with water-soluble herbal extracts. Oil phase was made separately and emulsified by slow addition with continuous stirring (Aqueous Natural Mucilage Emulsification).

**Harishchandre S. et al. (2025) – Annona squamosa Leaf Conditioner**

Formulation: Annona squamosa, Aloe vera, Fenugreek, Neem, Hibiscus. pH, viscosity, irritation and stability. "The skin was not irritated and the feeling was highly moisturized. Leaf extracts are rich sources of antioxidants".

**Method** - Oil-in-water technique was employed. Extracts and oils were combined at 70 °C, then the mixture was homogenized. ingredients were added the temperature below 40 °C (Oil in Water Emulsification Method).

**Sanika Venkat Mukke et al. (2025)**

Review on Herbal Hair Conditioners. Formulation: Comparative analysis of several herbal hair conditioners to be able to use hibiscus, fenugreek and aloe vera. "Herbal hair conditioners are safer and more environmentally friendly. Natural saponins in herbs act as mild surfactants, both are emulsifier and Vitamin E non-synthetic, this is consistent with trends in skincare formulation development".

**Method** – *Comparative Emulsion Techniques.*

**Pariksha et al. (2025)**

Formulation of Herbal Conditioner Formulation - multifunctional amino acids and antioxidants produce herbal hair conditioning and moisturizing effects. (Hot Emulsification Method).

**Method** - Hot emulsification method was used; the aqueous herbal extract phase was combined with oil phase.

**EVALUATION PARAMETER**

Several tests are typically employed to evaluate the quality and efficacy of herbal hair conditioners. Many researchers have varying techniques depending on the formulation base and selected herbal ingredients. Parameters such as stability, pH, viscosity, spread ability, irritation potential, moisture retention and conditioning efficiency in generally evaluated.

**1. PH Determination**

The pH of hair conditioner is one of the main factor that directly contribute to the health of the scalp and the maintenance of the natural acid mantle. A slightly acidic pH (5.5-6.2) is able to inhibit microbial growth and Hair cuticle smoothness is attained.

**Kiruthiga S.et al.(2024 - WJPR)**

Firstly, the prepared herbal hair conditioner was able to maintain the pH range between 5.8 and 6.2 which is not only safe for the scalp but also in line with the natural hair physiology. The product demonstrated the ideal acid - base balance to both avoid the situation of the skin being irritation and to keep its texture smooth.

**Meghraj A.Patil et al.(2019- Polyherbal Hair conditioner)**

The reported pH value range between 5.6 and 6.0, thus the formulation was compatible with the same cosmetic products and cuticle protection was guaranteed during conditioning.

**Harishchandre S.et al.(2025 - Annona squamosa leaf conditioner)**

The resulting conditioner had a pH range of 5.5-6.0 which was very close to the pH of the scalp with no negative effects being evident during the trial.

**Pariksha et al.(2025 - Herbal conditioner cream)**

The digital pH meter recorded pH value from 5.8 to 6.2 which were in line with mild surfactant formulation and hence the scalp was comfortable without dryness or irritation.

## 2. Viscosity Determination

Viscosity is what mainly influences the flow behavior, spreadability, and the ease of application of hair conditioners. Additionally, it is related to user satisfaction and the uniform distribution of actives.

### **Kiruthiga S. et al. (2024)**

Brookfield viscometer was used to measure the viscosity. The findings showed always the product to be of a cream, like consistency the flow properties are just perfect, the product could be easily spread and there was no phase separation after storage.

**Meghraj A. Patil et al. (2019)** Reported a consistent viscosity in suitable for cosmetic conditioners. The product are stayed homogenous without any thickening or liquefaction, thus confirming the stability of the formulation.

**Harishchandre S. et al. (2025)** The viscosity of the *Annona squamosa* formulation was stable during the entire testing and it had a lotion, like consistency without any phase separation during storage or temperature change.

### **Pariksha et al. (2025)**

Viscosity was measured with the viscometer to guarantee a consistency similar to that of a product. The product showing a consistent texture throughout, is a good indication of the proper mixing of phases and the system being stable from the rheological point of view.

## 3. Stability studies

Stability testing identifies to resist the different environmental factors such as temperature, humidity, and time, thus guaranteeing product uniformity and safety throughout the shelf life.

### **Kiruthiga S. et al. (2024)**

The formulation was kept to 25C and 40C for a period for 3 months. result was retained product high thermal and stability, consistency as no phasesvseparation, discoloration, or change in texture was detected.

### **Meghraj A. Patil et al. (2019)**

During the entire testing period, the product remained stable and no sedimentation or microbial growth has observed in the formulation, which is indicative of its long, term durability.

**Harishchandre S. et al. (2025)**

Stability tests under different humidity and temperature conditions (25C, 37C, and 45C) showed that there were no changes in the appearance or the smell of the product, thus confirming its excellent resilience.

**4. Irritation, safety Test**

Safety assessment confirms that the herbal formulation is a non, irritant and can be used on scalp of any type. Commonly, patch tests and studies on volunteers are done.

**Kiruthiga S. et al. (2024)**

They performed a patch test on human volunteers and the result was that no irritation, redness or itching was observed. Hence, the product was non, irritant and safe for regular use.

**Harishchandre S. et al. (2025)**

There was no report of itching or allergic reaction after the application. The product safety and comforting feature were verified by skin patch studies which the authors associate with Aloe vera and Annona leaf antioxidants.

**Pariksha et al. (2025)**

A natural patch test was conducted on 10 volunteers. No one reported discomfort, thus the conditioner was confirmed as mild and without irritation.

**Meghraj A. Patil et al. (2019)**

Though no specific irritation data were provided, it was mentioned that no skin or scalp area was adversely reacted during the pH and application tests, thus the safety of the formulation is implied.

**EVALUATION SIGNIFICANCE**

The results obtained from these criteria provide scientific proof of the herbal hair cream's performance and stability.

Physically and chemically test is confirming the structural integrity with more and compatibility of the materials on formulation Microbiological and stability studies ensure safety and preservation. Sensory and diffusion tests assess consumer usability and marketability.

According to Kokate *et al.*, Herbal Medicine Technology (2018), and Hari Cosmetics (2008), its ideal herbal hair cream should be demonstrating stability, safety, and efficacy similar to its synthetically while preserving their benefits of herbal ingredients. Advantages of the Herbal Hair Cream Formulation in this benefits lot of positive impact Herbal Hydration: to work as a nourishment through plant-based proteins and antioxidants.

Safe Preservation: Sodium benzoate ensures microbial safety; paraben-free. Hydration: Aloe vera and glycerin maintain scalp hydration and balance.

## CONCLUSION

Our formulation contains Aloe Vera, Vitamin E, Sodium Benzoate. This product has a modern effect and is customized to keep your hair healthy and protected. It provides conditioning and hydration that has a very effective effect on hair nutrition. The natural protein in Aloe Vera will make your hair very soft and strong, and Aloe Vera helps moisturize the scalp and hair. We also consider Vitamin E as an antioxidant that prevents hair loss and eliminates dryness. During the day due to family heat our hair becomes very dirty and dandruff also gets included so it provides relief from such problems we consider sodium benzoate here as an antimicrobial preservative which only keeps the product for a long time and removes problems like bacterial microbes in it we tell the result of studies of inclusion of such properties which have been obtained by adding herbal ingredients it reduces conditioning so its formula is very technical and health helps a lot in hair growth, shine and softening it different types of products which are chemical based People are now moving towards natural herbal products like botanicals like aloe vera and combination formulas of vitamin A which have been representing a durable element in our pharmaceutical science. Here we focus on the formulation of our product produced using natural methods which makes this cream the best results.

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