

Formulation and Evaluation of Herbal Hair Removal Powder

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Abstract

The demand for natural and safe personal care products has led to the development of herbal alternatives for hair removal. This study focuses on the formulation and evaluation of an herbal hair removal powder using plant-based ingredients known for their depilatory and skin-nourishing properties. The selected ingredients include Harita Manjari (*Acalypha indica*), Papaya (*Carica papaya*), Turmeric (*Curcuma longa*), Sandalwood (*Santalum album*), Rose (*Rosa rugosa*), Ponnatharam (a mineral-based component), Camel milk, and Rice flour. These natural components have been traditionally used for hair removal, skin brightening, and soothing effects.

The formulation was developed by blending powdered forms of these ingredients and was evaluated based on organoleptic, physicochemical, phytochemical, and rheological properties. Various tests, including pH measurement, ash value determination, loss on drying, and phytochemical analysis, were conducted to assess the quality and effectiveness of the formulation. The results indicated that the prepared herbal hair removal powder exhibited good depilatory action, skin compatibility, and ease of application while minimizing irritation.

This research highlights the potential of herbal alternatives to replace chemical-based hair removal products, which often cause skin irritation and other adverse effects. The findings support the growing trend of natural cosmetic formulations, promoting safer and more sustainable skincare options. Further studies and optimizations can enhance the product's efficacy, ensuring a broader consumer acceptance.

Keywords: Ponnatharam powder, Harita manjari, Camel milk powder, Hair removal powder, Smoothing.

INTRODUCTION

Hair removal is important cosmetic item for not only women but also for men. Synthetic hair Removal is powerful irritants and has been implicated powerful irritates in several type of allergies and other therapeutic problems. Other irritant ingredients include Barium sulfide and Calcium thioglycolates. This can penetrate in our skin has been determined to cause cancer. If we use permanent or semipermanent

hair removal we are increasing the risk of developing skin cancer. Prolonged uses of hair removal generally cause a local irritation and skin toxicity problems¹. The use of hair removal is not new. The art of hair removal was used by Ancient Egyptians from beeswax and sugar from the early 3000 years BCE. The first artificial removal was synthesized in 1844. Harita Manjari was the most popular and still one of the popular hair Removal Ingredient regular Application of these powder makes hair thinner and remove it without pain.⁴

Excessive hair growth also known as 'Hirsutism' can be caused by number of conditions and medications like Genetic influence, Polycystic ovary syndrome [PCOS], Minoxidil, Danazol. A need was felt to formulate a product which is safe for use and does not have any problems of hypersensitive reactions. In the present investigation the formulation is developed to get natural hair removal using combination of natural ingredient.²

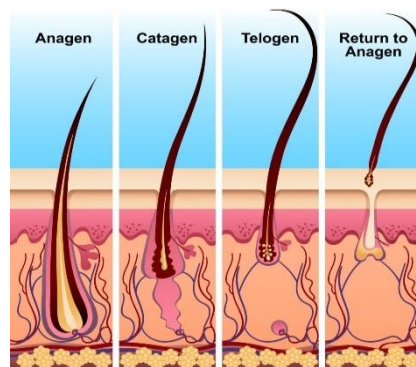


Figure No 1:- Hair Structure

The main aim of this investigation is to formulate natural and safe hair removal powder. As compared to the chemical based hair removal, which cause skin related diseases natural herbal hair removal are being preferred nowadays. Today most of the human beings are very careful about their beauty and skin. herbal drugs without any adverse effects are used for hair removal. Natural hair removal solve the problem of irritation, rashes and pain which are safe for use and does not have the problems of itching and hypersensitive reactions.¹

Harita Manjari based hair removal powder that imparts natural hair removing property and spreads evenly across the hair and leave behind fragrant, soft and smooth skin. A systematic scientific approach towards the active constituent can prevent skin damage caused by photo-oxidation reaction.⁸ So, need was felt to designed formulate Herbal hair removal powder with commonly implied natural herbs to be an alternative source to the synthetic and semi-synthetic hair removal. The need of herbal based natural medicine is increasing fast due to their natural goodness and lack of side-effects. Ponnatharam, Papaya powder, turmeric, sandalwood are well known herbal drugs traditionally used as hair removal.⁴

The cosmetics and personal care industry's hair removal market is growing in importance. Teenage girls and women are often concerned about the unwelcome hair development. Hair removal methods fall under two categories of depilation and epilation. Depilation removes the hair shaft and includes techniques such as shaving and chemical depilatories. Epilation removes the hair shaft, follicle, and bulb, and includes techniques such as plucking, threading, waxing, sugaring, lasers, intense pulsed light system (IPL), electrolysis, and photodynamic therapy.²

Both men and women must cope with the issue of hair growth in places on their bodies where it is not desired. Although undesired hair is not harmful to health, it is thought to have an impact on person's ability to look their best. Unwanted facial and body hairs has a function in one's cosmetic appearance.¹ Depilatories are a general term for items used to remove unwanted hair. Naturally obtained ingredients like Ponnatharam and Harita Manjari are mainly responsible for removing hair.³ There is a risk of irritability whenever chemical removal is utilized. Hence, finding herbal depilatory drugs that are safe to use and have no negative side effects is the major goal of our research. Women used to apply turmeric everyday while taking a bath, there are many other medicinal herbs that are important in suppression of hair.⁶

PLANT PROFILE

1] Harita Manjari

Harita Manjari, scientifically known as *Acalypha indica*. This offers a gentle and yet powerful way to remove hair naturally, without any harsh chemicals. It shows the presence of Alkaloids, Phenols, Saponin, Flavonoids. Harita Manjari contains vitamin A, C. The natural leaves of plant are rich in protein and antioxidant and used for various diseases also helps for skin problems.

Scientific Classification

Kingdom:-Plantae

Order:- Malpighiales

Family:- Euphorbiaceae

Subtribe:- Acalyphinae

Genus:- *Acalypha*

Species: *Acalypha Indica*



Fig No 2:- Harita Manjari

2] Papaya

Papaya includes enzymes that can weaken facial hair follicle and bleach your facial hair, regular usage of homemade face-pack can stop hair regrowth. Papain is an enzyme found in the white fluid [latex] that occurs in raw papaya fruit. It is a protease. Meaning it breaks down protein. It contains many chemical constituents including vitamins, minerals, antioxidants, flavonoids, alkaloids.

Scientific Classification

Kingdom:-Plantae

Division:- Magnoliophyta

Class:- Magnoliopsida

Sub-class:- Dilleniidae

Order:- Brassicales

Family:- Caricaceae

Genus:- Carica



Fig No.3 Papaya

Species:- Carica papaya

3] Turmeric

Turmeric is the bright yellow-orange rhizome contain Curcumin the main bioactive compound known for its powerful anti-inflammatory, anti-oxidant and medicinal property. Turmeric has been traditionally used for hair removal, especially in India and other part of South asia. Its property helps weaken hair follicles over time, leading to final and reduced hair growth. It also has antibacterial and anti-inflammatory benefits, making it gentle on skin.

Scientific Classification

Kingdom:-Plantae

Division:- Magnoliophyta

Class:- Magnoliopsida

Sub-class:- Zingiberidae

Order:- Zingiberales

Family:- Zingiberaceae



Fig No.4 Turmeric

Genus:- Curcuma

Species:- Curcuma longa

4]Sandalwood

Sandalwood is a class of wood from trees in genus Santalum. The woods are heavy, yellow and fine grained and unlike many other aromatic woods, they retain their fragrance for decades. Sandalwood is reported to possess plethora of bioactive compounds such as essential oil and its compound [α -santalol and β -santalol] phenolic compound and fatty acids. It is known for variety of therapeutic property including anti-inflammatory, antioxidant, antiviral and antibacterial activity. No significant toxicity has been indicated by sandalwood and its individual constituent.

Scientific Classification

Kingdom:- Plantae

Division:- Magnoliophyta

Class:- Magnoliopsida

Sub-class:- Rosidae

Order:- Santalales

Family:- Santalaceae



Fig No.5 Sandalwood

Genus:- Santalum

Species:- Santalum album

5] Rose

Rose is a woody flowering fragrant, very pleasant plant. It comes in many colours and types. It has more than 300 species. Their stems are usually prickly and their glossy green leaves have toothed edges. It mainly includes flavonoid, glycosides, phenolic acids, Pentacyclic triterpenes and steroids. Roses are best known as ornamental plants grown for their flowers in the garden. It also uses in various perfumes, culinary, medicine. They are loaded with vitamin C supports the production of white blood cells to help our bodies fight off infection, cold, flu's. rich in antioxidants and helps to reduce stress.

Scientific Classification

Kingdom:- Plantae

Division :- Magnoliophyta

Class:- Magnoliopsida

Sub-class:- Rosidae

Order:- Rosales

Family:- Rosaceae

Genus:- Rosa



Fig No. 6 Rose

Species:- Rosa rugosa

6] Ponnantharam

Ponnanthram/Hartal varki/Haratal stone is a kind of mineral. It is a golden yellow in colour used in hair removal. The process is slow but steady usage leads to permanent hair removal with skin brightening in applied area. Ponnantharam powder effectively cleans the skin, remove dirt, impurities and excess oil, while maintaining the natural balance of skin. It has smoothing and calming effect on skin helps to reduce inflammation, skin irritation and itching.

- **Benefits for your skin:**

Ponnantharam powder offers a wide range of benefits for your skin:

- **Deep Cleansing:** Ponnatharam Powder effectively cleanses the skin, removing dirt, impurities, and excess oil, while maintaining the natural balance of the skin.
- **Exfoliation:** The gentle exfoliating properties of Ponnatharam Powder help remove dead skin cells, revealing a smoother and brighter complexion.
- **Skin Brightening:** Regular use of Ponnatharam Powder can help even out the skin tone and brighten the complexion, giving you a natural glow.



Fig No.7 Ponnantharam

7] Camel milk

Camel milk is milk from female camel that has been used for thousands of years by nomadic and pastoral culture. It contains lactic acid, a gentle exfoliant that helps remove dead skin cells, revealing a brighter skin and smoothing complexion. It also contains protein, vitamins and higher concentration of

lactoferrin, lactoglobulins and lysozyme than bovine milk. Camel milk is also high in vitamin B, C and minerals like zinc, magnesium and iron which breaks down dull, dead skin and addresses hyperpigmentation to help even skin tone, skin conditions like eczema and psoriasis. It's believe that its anti-inflammatory and antimicrobial properties may help smooth and heal the skin.

Benefits for your skin:

- Exfoliation: Camel milk contains alpha-hydroxy acids (AHAs), like lactic acid, which can help remove dead skin cells.
- Collagen production: Camel milk can stimulate collagen production, which can help reduce wrinkles and firm the skin.



Fig No.8 Camel milk

8] Rice

Rice is a type of grain that is a staple food for billions of people worldwide. It's a seed from the *Oryza sativa* plant. Rice is known for skin soothing and brightening properties. It often used in skincare product and home remedies for various skin concerns. It has extended for lot of centuries and historically been in used by women and men too. It is rich in vitamins, minerals and antioxidants and can be incorporated into your skincare routine in various ways as it reduce hyperpigmentation from skin exposure and post acne breakouts.

Scientific Classification

Kingdom:- Plantae

Division :- Magnoliophyta

Class:- Liliopsida

Sub-class :- Commelinidae

Order:- Poales

Family:- Poaceae



Fig No. 9 Rice

Genus:- *Oryza*

Species :- Oryza sativa

AIM AND OBJECTIVE OF STUDY

Aim: Formulation and evaluation of herbal hair removal powder.

Objective:

- To identify and use herbal ingredients with natural hair removal properties.
- To ensure the formulation is gentle, non-irritating, and suitable for all skin types.
- To ensure a formula efficiently dissolves and removes unwanted hair.
- To maintain an optimal pH to protect the skins natural barrier.
- To reduce unpleasant odors often associated with hair removal products.
- To develop packaging and branding strategies for commercialization while maintaining affordability.

MATERIALS AND METHODS:

Plants: Harita manjari, Papaya, Rose.

Collection of Leaves

Fresh Petals of rose collected from the local market of Wardha, Maharashtra. Harita manjari, papaya, Ponnatharam clay, Rice powder, Camel milk, Sandalwood all in powdered form were procured from the authorized store and local market in powdered form. Then all ingredients were pass through sieve no and this powdered were mixed uniformly to prepare homogenous formulation.

Cleaning and Drying of Plant material:

The collected petals were washed with Water to remove unwanted dust and dirt and then sun dry for 3 days to remove the unwanted moisture from it, and then this dried petals was powdered with the help of Mortar and pestle.

Sr.No	Ingredients	B1	B2	B3
1	Ponnatharam	11g	10g	9g
2	Harita manjari	13g	14g	15g
3	Camel milk powder	6g	6g	6g
4	Rice flour	6g	6g	6g
5	Papaya powder	3g	3g	3g
6	Sandalwood powder	4g	4g	4g
7	Turmeric powder	4g	4g	4g
8	Rose powder	3g	3g	3g


Table No 1:- List of Ingredient for Hair Removal Powder preparation.

Equipment

All the material was procured from online site and all the necessary laboratory equipment and apparatus sere used for the formulation were used from the college laboratory of Dr.R,G Bhojar Institute of Pharmaceutical Education and Research, Wardha.

Table No.2 Roles of Ingredients in Formulation

Common Name and Scientific Name	Part used	Uses	Figure
Harita manjari	Leaves	Used to remove unwanted hair	
Rose	Flower	Used for the skin, including hydrating, smoothing, and preventing acne.	
Turmeric	Rhizome	Used to skin glow while soothing it.	
Papaya	Fruits	Used for hair removal as it contains enzymes that can help exfoliate the skin and potentially weaken hair follicles.	
Sandalwood	Stem	Used to Lightens scars and Brightens skin tone.	
Ponnamtharam	stone	Used to remove unwanted hair from the body.	
Camel	Milk	Used to remove unwanted hair.	

Rice	Rice	It helps weaken hair follicle and Inhibit hair growth.	
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Methods:

Preparation of hair removal powder:

All the ingredient were weighed accurately according to the measured quantities given in the table no.

↓
Collected ingredients were mixed and made into fine powder using mortar and pestle.

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Then obtained powder were passed through sieve to obtain uniform size.

↓
Then this mixed powder carefully transferred into a container.

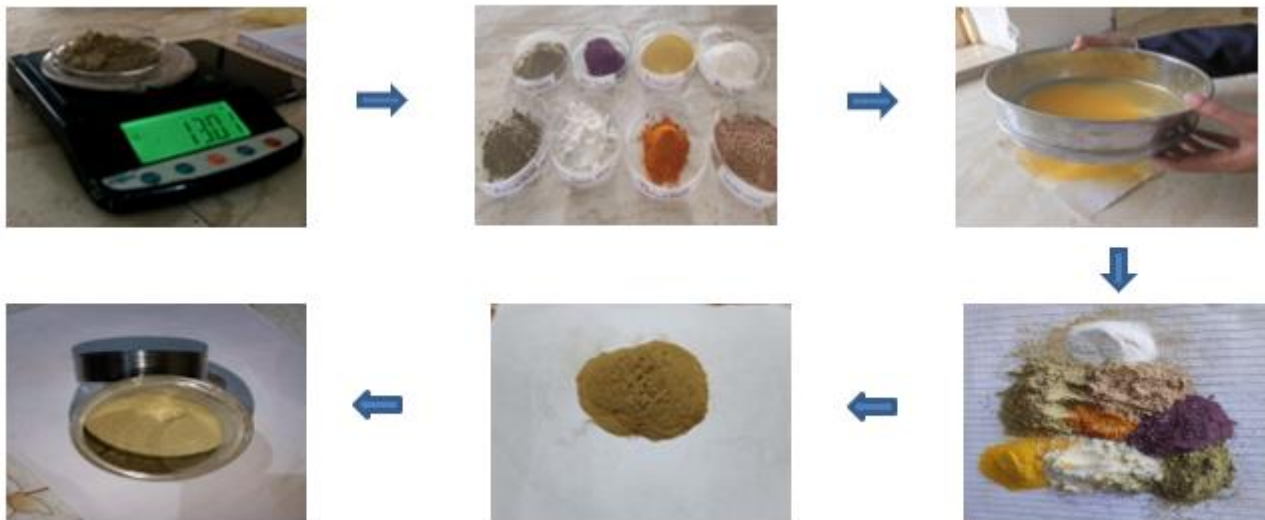


Fig No 10:- Preparation of Hair Removal Powder

Application of hair removal powder

This mixture of powder should be used monthly on unwanted hair growth, by forming a paste with milk, rose water or water of optimum consistency. It should be applied on unwanted hair area with use of brush. Then it should be left for 20-30 min for drying purpose. Then it should be rub in opposite direction of hair growth with cotton cloth and wash.

Evaluation of hair removal powder:

The prepared hair removal powder was evaluated for its various organoleptic, physic-chemical, phyto-constituents as well as rheological parameter.

Organoleptic evaluation

Organoleptic characteristics for various sensory characters like colour, odour and texture, etc. The raw drugs and powders were separately studied by organoleptic and morphological characters like colour, odour, texture and appearance.

Phytochemical Evaluation:

The prepared polyherbal hair removal powder were subjected to phytochemical evaluation for studying and reveal the presence or absence of various phytochemicals such as Alkaloids, Phenol, Tannin, Steroids, Flavonoids, Saponin, etc.

Test for Alkaloids

- Add a few drops of wagner's reagent to the plant extract
- A reddish- Brown precipitate indicate the presence of alkaloids.

Test For Saponins

- Shake the plant extract with water. The formation of a stable foam indicate the presence of saponins.

Test for Flavonoids

- Add a few drops of dilute NaoH to the powder extract.
- A yellow colour indicate presence of flavonoids.

Test for Steroids

- Mix the extract with chloroform and add conc. Sulfuric Acid.
- A reddish brown colour at the interface indicate the presence of steroids.

Test for Tannins

- Add few drops of ferric chloride solution to the powder extract.
- A blue black colour indicates the presence of tannins.

Test for Phenols

- Add a few drops of Ferric Chloride solution to the powder extract.
- A green or blue colour indicates the presence of phenol.

Rheological Parameters:

Rheological parameters like bulk density, Tapped density, Angle of repose, Carr's index, Hauser's ratio.

A. Bulk Density:

- 10g of product was taken in a 100ml of measuring cylinder.
- Bulk density was calculated by using following formula.

Bulk density = $\frac{\text{Mass of sample}}{\text{Bulk of volume}}$

Bulk of volume

B. Tapped density:

- 10g of sample was taken in a measuring cylinder.
- The cylinder was then placed on tapped density tester.
- After around 100 taps constant volume was obtained and tapped sensity was calculated using following formula.

Tapped density = $\frac{\text{Mass of sample}}{\text{Tapped volume}}$

Tapped volume

C. Angle of repose:

- Clean and dry funnel was taken having 20-30 mm of diameter.
- Then this funnel was attached with burette stand and surface where the stand was placed along with funnel and maintain the height of above 2cm.
- Then placed Graph paper below the funnel to draw the circle along the pill.
- 10g of powder required quantity was poured form top of the funnel till the heap was formed on the surface.
- Then circle was drawn with a pencil around the heap.
- The pill (h) and radius of the base(r) were measured with the ruler.
- Angle of repose θ was measured by given formula with the ruler.
- Angle of repose = $\theta = \tan^{-1} \frac{h}{r}$.

D. Porosity:

It is calculated by subtracting true volume from Bulk volume, whole divided by bulk volume.

E. % porosity

It is calculated by porosity times 100.

F. Hausner’s Ratio:

It is the ratio of Tapped density and Bulk density time 100.

Physio-Chemical Evaluation

A. pH

- Add 10g of sample in ml of distilled water and then filtered it, then pH was calculated using pH paper.

B. % Loss on Drying:

- In crucible 2g of sample was taken.
- Then it was heated till constant weight was obtain.

Formula :

$$\% \text{ Loss on Drying} = \frac{\text{L.O.D}}{\text{Total mass of wet sample}} \times 100$$

C. Ash Value:

- Weighed accurately 3g of sample.
- Then this sample was placed in crucible and incinerated by increasing the heat gradually unit the product was free carbon it by keeping it in desiccators.
- Weighed the ash and calculated the total ash value and % of total ash.

RESULT

Organoleptic Evaluation

Sr No.	Organoleptic Evaluation	Result
1	Colour	Yellowish brown
2	Odour	Characteristic

3	Texture	Fine and smooth
4	Appearance	Powder
5	Washability	Easily washable

Table No. 3 Organoleptic Evaluation
Phytochemical Evaluation

Sr. No.	Tests	Results
1.	Test for Alkaloids	Present
2.	Test for flavonoids	Present
3.	Test for Tannins	Present
4.	Test for Saponins	Present
5.	Test for Steroids	Absent
6.	Test for Phenols	Present

Table No.4 Phytochemical Evaluation
A. Rheological Evaluation :

Sr. No	Parameter	Result
1	Bulk Density	0.4g/ml
2	Tapped Density	0.71g/ml
3	Angle of repose	9.09 ⁰
4	Carr's Index	43.6
5	Hausner's Ratio	1.77
6	Porosity	0.5
7	%Porosity	50%

Table No. 5 Rheological Evaluation
Physio-Chemical Evaluation:

Sr No.	Parameters	Results
1	pH	7
2	L.O.D	0.1 g
3	Ash Value	1.18 g
4	% L.O.D	5.2 % w/w
5	% Ash Value	59 %

Table No. 6 Physio – Chemical Evaluation
DISCUSSION
9.1 Preparation of hair removal powder

Formulation was prepared from necessary laboratory equipment's and required materials were purchased from the local market of Wardha.

9.2 Evaluation of hair removal powder:
A) Organoleptic Evaluation:

It includes the analysis of organoleptic properties of the formulation such as colour, odour, texture, etc.

- Colour of the formulation was found to be Yellowish Brown.
- Odour of the formulation was found to be Characteristic.
- Texture of the formulation was found to be Fine and smooth.
- Appearance of the formulation was found to be Powder.
- Washability of the formulation was found to be Easily washable.

B) Physio-chemical evaluation:

- **pH:** The product has a neutral pH of 7.0 making it suitable for various applications without causing irritation.
- **Ash Value:** The total ash value is 1.18 g, corresponding to 59%, indicating the presence of inorganic content, which may include minerals and impurities. A high ash value may suggest contamination or high mineral content.
- **Loss on Drying (L.O.D):** The L.O.D is 5.2%, indicating the moisture content of the sample. A moderate moisture level suggests the product is stable, but further drying may improve shelf life.

C) Phytochemical evaluation:

- **Presence of Alkaloids, Flavonoids, Tannins, Saponins, and Phenols:** The presence of these bioactive compounds suggests potential pharmacological benefits, such as antioxidant, anti-inflammatory, and antimicrobial properties.
- **Absence of Steroids:** This may indicate the product lacks certain hormonal effects associated with steroids.

D) Rheological parameter:

- **Bulk and Tapped Density:** The bulk density (0.4 g/ml) and tapped density (0.71 g/ml) suggest that the product has moderate flowability and packing characteristics.
- **Angle of Repose (9.09°):** A low angle of repose indicates good flowability, meaning the powder is not highly cohesive.
- **Carr's Index (43.6%) & Hausner's Ratio (1.77):** These values indicate poor flowability and compressibility. A high Carr's Index suggests the material is likely to form clumps and may require flow enhancers for better processing.
- **Porosity (50%):** The high porosity suggests the material has good air retention and lightweight properties, which could be beneficial for certain applications.

CONCLUSION

According to our study findings, a well-formulated herbal hair removal powder is an excellent alternative for individuals seeking natural, chemical free and skin friendly hair removal solution. However, standardizations, Patch testing and optimization of ingredients ratios are crucial for achieving consistent results and safety for all skin type. The development of herbal removal powder aims to provide safe, natural and effective alternative to chemical depilatory products. By incorporating natural ingredients with depilatory, skin soothing and brightening properties, the formulation ensures hair removal while minimizing skin irritation.

The advantages of herbal hair removal powder are their natural ingredients that are gentle on the skin. Herbal formulation often have fewer potential side effects compared to chemical depilatories. This hair formulation are more affordable than some commercial hair removal products and hair removal powder can be used for various body areas including legs, arms and Bikini areas.

In this research, we found effective properties of herbal hair removal powder and further studies are needed to be performed to explore more useful benefits of this powder. Natural remedies are widely accepted with open hands nowadays as they are safe with minimal side effects. Herbal formulation is in great demand to fulfil the need of the growing world market. It is noticeable attempt to formulate the herbal hair removal powder. Containing the goodness of different plants, which are excellent for skin care.

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