PREPARATION AND EVALUATION OF DEPILATORY CREAM CONTAINING PONNATHRAM POWDER

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Abstract

This study focuses on formulating and evaluating a depilatory cream prepared using Ponnathram (Hartala) powder, a traditional yellow mineral historically used in South Indian practices for hair-removal purposes. Because the raw mineral contains arsenic compounds, it was first subjected to the Shodhana detoxification process, involving cleaning, boiling in herbal media, repeated heating, and quality checks to obtain purified Ponnathram suitable for topical use. The cream was prepared by incorporating the purified powder into a base composed of methyl cellulose, glycerin, talc, and water, resulting in a uniform paste.The formulation was assessed for its organoleptic properties, pH, homogeneity, spreadability, and viscosity. The prepared cream exhibited a bright yellow appearance, smooth texture, and it was free from lumps or grittiness. The pH was strongly alkaline, consistent with the mechanism of chemical depilatories that weaken the keratin structure of hair. The spreadability and viscosity values indicated that the cream could be easily applied and maintain a suitable consistency.The study provides preliminary information on the physical characteristics of a Ponnathram-based depilatory cream offering a basis for further investigation into its performance and safety.

Index terms: Ponnathram powder, Hartala(orpiment), depilatory cream, arsenic trisulphide, Traditional yellow mineral, Hair removal cream, shodhana, topical formulation, keratin breakdown, alkaline depilatory, herbal detoxification, cosmetic evaluation, spredability.

I. Introduction

Depilatory creams are often used in research labs to remove hair before surgery, imaging, or other procedures. These creams, basically chemical hair-removal products, are designed to dissolve hair right at the skin's surface. They work by breaking the sulfur bonds in keratin, the protein that makes up hair, which reacts easily to strong alkaline and reducing agents. People have been using depilatories for centuries to get rid of unwanted hair. While many women today prefer shaving,

depilatory creams do have one clear advantage: they remove hair all the way down to the neck of the hair follicle, so the skin stays smooth for longer.

History of depilatory creams

- Depilatory creams have been widely used as chemical compounds for hair removal since ancient times.
- They have been widely used in ancient Egypt around 1500-3000 BCE as a mixture made from lime (calcium hydroxide), arsenic sulfide, resin, and oils to remove body hair.
- They are also used by ancient Greeks and Romans as depilatory formulas containing quicklime (calcium oxide) and orpiment (arsenic compounds) around 500 BCE-200 CE.
- During the 1920s, there was a patent development on depilatory creams for reducing odour by Joseph Donner. He used gums and patented sulphide-based depilatory creams.
- From these patented creams, Veet originated.
- During the 1940s, Nair is launched.
- But the use of sulphide-based depilatories has stopped because of its bad odour.
- During the mid-late 20th century, thioglycolate and alkaline bases for breaking keratin bonds were used, which reduce odour and improve safety.

Ponnathram stone

- Ponnatharam is a traditional yellow mineral used in South India, especially in Siddha and Ayurvedic practices.
- It is also known as hartala (orpiment).
- It is subjected to shodhana for reducing side effects.
- It is mainly applied to the face, hands, and legs for permanent hair removal.
- It is a mineral of arsenic and sulfur.
- It is subjected to shodhana before used for any medicinal preparation because of its toxicity.

Shodhana

It is a detoxification process that contains metals in raw materials.

It involves the following steps...

Step 1: Selection & cleaning

Good quality powder is chosen, and the external dirt is removed

Step 2: Boiling in fruit/medium

It involves classical methods and modern methods

Classical method: it involves enclosing the mineral inside the fruit of Karaballi (a kind of gourd), and it is boiled for 1hr. By using the Dola yantra apparatus.

Modern method: In this method, the powder is treated with media like fruit juice, kushmanda or decoction.

Step 3: Repeated heating/incineration

Here, the powder is subjected to boiling 12 times than the post-boiling.

Step 4: Testing/analysing

The obtained powder is tested/analysed for changes in color, odour, and pH and tested for reduction in levels of metals.

The final obtained powder is considered “Suddha”, which is being used in further formulations.

How It Is Used for Hair Removal

1. The stone is crushed into a fine powder.
2. It is mixed with natural ingredients such as milk, rose water, rice flour, papaya paste, or herbal powders.
3. The mixture is applied to areas with unwanted hair.
4. After drying, the paste is gently rubbed or washed off.
5. With regular use, people traditionally claim it weakens hair roots and reduces hair growth over time.

II.Materials and methods

A.Materials

Ponnathram powder, glycine, water, methyl cellulose, talc, perfume.

B.Detoxification of Ponnathram powder

The powder is subjected to the shodhana process for detoxification of metals present in it.

C.Preparation of depilatory cream

The required quantity of methyl cellulose was first dissolved in water with continuous stirring until a uniform solution was obtained. To this, glycerin was added and mixed thoroughly to form a smooth base. Talc was then incorporated gradually into the mixture with constant stirring to ensure even dispersion. Finally, the ponnathram powder was added slowly with continuous stirring using a glass rod until a uniform cream-like consistency was achieved.

D.Evaluation of depilatory cream formulated

1. Organoleptic Characteristics: Visually inspect the cream under good lighting.

Checking for lumps formation, phase separation, grittiness, and uniform colour.

2. pH: 10g depilatory cream was mixed with 10mL boiled and cooled water; pH was measured within 5 minutes.

3. Homogeneity: Verified by visual inspection on cream present in the motor & pestle.

4. Spreadability: 1-2g of depilatory cream was placed between glass slides; the spread measured after 3 minutes.

Spreadability (S) = mass taken x distance moved/Time taken

5. Viscosity: The Viscosity of the formulated cream was determined using the Brookfield Viscometer RV model. Spindle no. 5 and spindle speed 10 rpm at 25°C were used; the corresponding dial reading on the viscometer was noted.

Figure 1: ponnathram powder

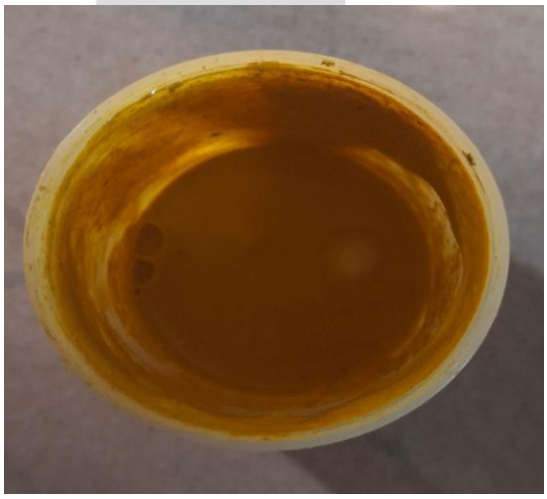

Figure 2: Homogeneous mixture of depilatory cream

Figure 3: Motor & pestle containing a Homogenous mixture

TABLE 1: Composition of depilatory cream

S.NO	Ingredients	Quantity taken
1	Ponnathram powder	6g
2	Methyl cellulose	1g
3	Talc	5g
4	Glycerin	10ml
5	Water	q.s
6	Perfume	q.s

III.Results and discussion

The formulated depilatory cream exhibited a bright yellow colour, a Smooth, homogeneous paste with no visible lumps, crystals or separation. No gritty feeling. The P^H of the depilatory cream was strongly alkaline in nature. The spreadability of cream was 0.65cm/sec.

IV.Conclusion

In this study, we developed a depilatory cream using Ponnathram (Hartala) powder, a traditional yellow mineral known for its long history in hair-removal practices. Before using it, the powder was carefully purified through the Shodhana process to reduce its natural toxicity and make it safer for topical application. Using common cosmetic ingredients like methyl cellulose, glycerin, and talc, we were able to prepare a stable and smooth cream. The final formulation showed good appearance, uniform texture, and easy spreadability, with no lumps or gritty particles. Its alkaline pH matches that of typical chemical depilatories, which act by breaking down hair structure. The cream also showed suitable viscosity, making it comfortable to apply on the skin. Overall, this work shows that a depilatory cream can be successfully prepared using purified Ponnathram powder, blending traditional knowledge with a modern cosmetic base. However, because Ponnathram contains arsenic, even after purification, more detailed safety, toxicity, and skin-

irritation studies are needed before it can be recommended for regular use. Future research can focus on improving the formulation to enhance both its effectiveness and safety.

References:

1. Richardo, Timmy, Liu, Xiaokun, Döhner, Katinka, Chao, Tsung-Yu, Buch, Anna, Binz, Anne, Pohlmann, Anja, de le Roi, Madeleine, Baumgärtner, Wolfgang, Brand, Korbinian, Bauerfeind, Rudolf, Förster, Reinhold, Sodeik, Beate, Halle, Stephan, and Cliffe, Anna Ruth, 2025, "Herpes simplex virus assembly and spread in murine skin after infection from the outside" Journal of Virology 1098-5514.

2. Clausen T, Schwan-Jonczyk A, Lang G, Schuh W, Liebscher KD, Springob C, Franzke M, Balzer W, Imhoff S, Maresch G, Bimczok R. Bellussi G, Bohnet M, Bus J, Drauz K, Greim H, Jackel KP, Karst U, Kleemann A, Kreysa G, Laird T, Meier W, Ottow E, Roper M, Scholtz J, Sundmacher K, Ulber R, Wietelmann U, editors. 2006. Hair preparations. Ullmann's encyclopedia of industrial chemistry. 7th ed. Wiley-VCH Verlag GmbH & Co. KGaA.;Weinheim: p. 204–241. https://onlinelibrary.wiley.com/doi/10.1002/14356007.a12_571.pub2. DOI: 10.1002/14356007.a12_571.pub2.

3. Howard, G.M. (1974). Depilatories. In: Perfumes, Cosmetics, and Soaps. Springer, Boston, MA.

DOI: https://doi.org/10.1007/978-1-4899-3055-2_5

4. Cosmetics and skin depilatories https://cosmeticsandskin.org/ded/depilatories.php

5.The Hidden History of Hair Removal – National Laser Institute: https://nationallaserinstitute.com/news-media/hidden-history-hair-removal/

6.The Evolution of Hair Removal – Skin Inc.: https://www.skininc.com/treatment/hair-removal/article/21884055/the-evolution-of-hair-removal

7. Depilatories – Cosmetics & Skin: https://cosmeticsandskin.org/ded/depilatories.php

8. The History of Hair Removal: From Ancient Times to Innovation – Starpil: https://starpil.es/en/blogs/noticias/the-history-of-the-hair-removal-fromancient-times-to-trapils-innovation

9. Chemical Depilatory – Wikipedia: https://en.wikipedia.org/wiki/Chemical_depilatory

10. Self-inflicted Chemical Burns caused by Depilatory Cream Use – Indian Journal of Burns: https://journals.lww.com/ijob/fulltext/2019/27010/self_inflicted_chemical_burns_caused_by_depilatory.10.aspx

11. Effects of Depilatory Cream Formulation and Contact Time on Mouse Skin – PMC / NCBI:https://doi.org/10.3390/ani12050581

12. French Company Launches Odourless Depilatory Cream – CosmeticsDesign-Asia: https://www.cosmeticsdesign-asia.com/Article/2009/02/19/French-company-launches-odourless-depilatory-cream/

13. **Pramod Baragi ,hartala an important compound used in ayurveda,journal of ayurveda and holistic medicine,vol 7 no.2 DOI:** https://doi.org/10.70066/jahm.v7i2.65

14. **Nilima Narayanrao Wadnerwar Comparative pharmaceutical evaluation of different samples of yellow orpiment (Haratala) and Ayurvedic mineral formulation (Rasamanikya) https://doi.org/10.47552/ijam.v15i3.4690**

15.Dr. Akanksha garud,Dr.P.K.Shrama,Dr.Navneet garud. A textbook of cosmetics,Pragathi prakashan publishers,2012.
16.M. vimaladevi.A textbook of cosmetics, CBS publishers,2005

17.Dr. Himadri panda,Herbal cosmetics handbook,Asia pacific business press*Inc*,*2015.*

18.B.M. mithal,R.N.Saha,A handbook of cosmetics Vallabh prakashan publishers,2015.

19. Bhudeb Mookerjee | 1938 | 28,803 words | ISBN-10: 8170305829 | ISBN-13: 9788170305828 https://www.wisdomlib.org/hinduism/book/rasa-jala-nidhi-volume-2