IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Development Of Seri Heal Guard Using The Sericin Gel For Better Healing

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Abstract: Silk sericin is a natural, water-soluble protein obtained as a by-product during the degumming of silk cocoons. It possesses excellent biological properties such as biocompatibility, antioxidant activity, moisturizing ability, and wound-healing potential. The present project aims to prepare and evaluate a topical healing cream formulated using silk sericin as the active biofunctional ingredient.

I. INTRODUCTION

Silk sericin was extracted from *Bombyx mori* silk cocoons using the HTHP method. The extracted sericin solution was then mixed with a cream base containing oil, water, emulsifier, and preservatives to prepare a smooth and stable healing cream. The prepared cream was tested for its appearance, ph, spreadability, and stability.

The sericin healing cream showed good texture, skin-friendly ph, and proper stability. Basic tests indicated that the cream has good healing and antimicrobial properties when compared with the control cream. This study shows that silk sericin can be effectively used to prepare a natural and safe healing cream.

The project also helps in utilizing silk industry waste for the development of value-added skin care products.

1.1 Objectives of Study:

- To extract silk sericin from *Bombyx mori* silk cocoons using a simple HTHP method.
- To prepare a topical healing cream using silk sericin as the main active ingredient.
- To evaluate the physical properties of the prepared cream such as color, texture, pH, and spreadability.
- To study the stability of the sericin healing cream under different storage conditions.
- To assess the basic healing and antimicrobial potential of the sericin-based cream.
- To explore the use of silk sericin, a silk industry by-product, for value-added and eco-friendly applications.

II. MATERIALS AND METHODOLOGY

Hydrated Silk Protein
Mustard oil
Bee wax
Shea butter
Magnesium flakes
Vitamin E
Preservative(Methyl paraben)
Essential oil

2.1.a.Hydrated Silk Protein

Type: Natural protein (from silk fibroin)

- Excellent moisture-binding ability
- Forms a protective film on skin or hair
- Improves smoothness, softness, and elasticity
- Enhances strength and reduces breakage
- Gives a silky, glossy feel

Function in formulation:

Acts as a conditioning and strengthening agent, improves texture and hydration.

2.1. b. Mustard Oil

Type: Natural vegetable oil

- Rich in omega-3 and omega-6 fatty acids
- Strong antimicrobial and antifungal activity
- Acts as a warming agent
- Improves blood circulation
- Contains antioxidants

Function in formulation**:**

Serves as an emollient, improves skin nourishment, and provides mild preservative action.

2.1.c Beeswax

Type: Natural wax

- Forms a protective barrier on the skin
- Prevents moisture loss
- Gives structure and thickness
- Mild antibacterial activity

Function in formulation:

Used as a thickening agent and stabilizer, improves product consistency.

2.1.d Shea Butter

Type**:** Natural fat

- Deep moisturizing and emollient
- Rich in vitamins A, E, and F
- Anti-inflammatory and soothing
- Promotes skin repair and elasticity

Function in formulation:

Acts as a natural moisturizer and skin-conditioning agent**.**

2.1.e Magnesium Flakes (Magnesium Chloride*)*

Type: Mineral salt

- Helps in muscle relaxation
- Supports skin barrier function
- Reduces inflammation
- Improves hydration at low concentrations

Function in formulation:

Used for relaxation benefits, skin nourishment, and mineral enrichment.

2.1.f. Vitamin E

Type: Antioxidant vitamin

- Powerful antioxidant
- Protects against oxidative damage
- Enhances skin healing
- Prevents oil oxidation

Function in formulation:

Acts as an antioxidant and stabilizer, increases shelf life.

2.1.g.Preservative – Methyl Paraben

Type: Synthetic preservative

- Broad-spectrum **antimicrobial**
- Effective against bacteria and fungi
- Stable over a wide pH range
- Extends product shelf life

Function in formulation:

Prevents microbial contamination and spoilage.

2.1.h. Essential Oil

Type**:** Natural essential oil

- Strong antibacterial and antifungal
- Refreshing fragrance
- Antioxidant activity
- Helps control excess oil

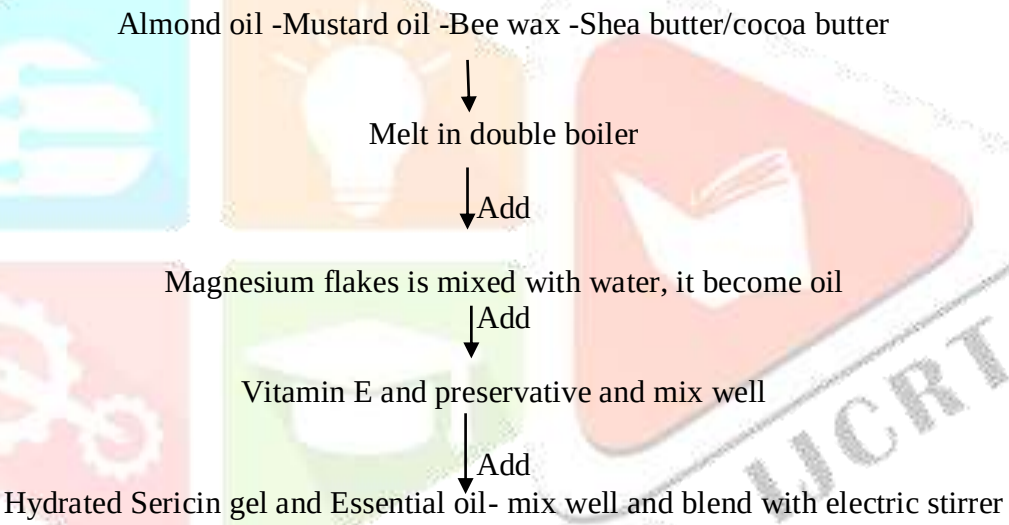
Function in formulation:

Used **for** fragrance, antimicrobial action, and freshness**.**

2.2 METHODOLOGY:

Take a clean glass bowl add calculated amount of Almond oil +Mustard oil +Bee wax +Shea butter/cocoa butter , Melt the oils in double boiler method add Magnesium flakes mix it with water, till it gets dissolved add Vitamin E and preservative and mix well, for the same add calculate amount of Hydrated Sericin gel and Essential oil- mix well and blend with electric stirrer. Leave the mixture to get it cool , transfer the cream into the air tight containers for further usage.

Flow chart



Flow chart 2.1 preparation process of heel guard

III.RESULTS AND DISCUSSION

3.1 Subjective Analysis of Heel guard cream:

The heel guard cream was distributed to the 30 volunteers of the kanakapura region, who were involved in reeling for whole day, and advised them to apply on to their palms every night soon after washing and drying their hands before going to bed for about 10 days and analysis is been done. The volunteers are observed that the cracks in hands got disappeared and healing property of the cream is considerably good.

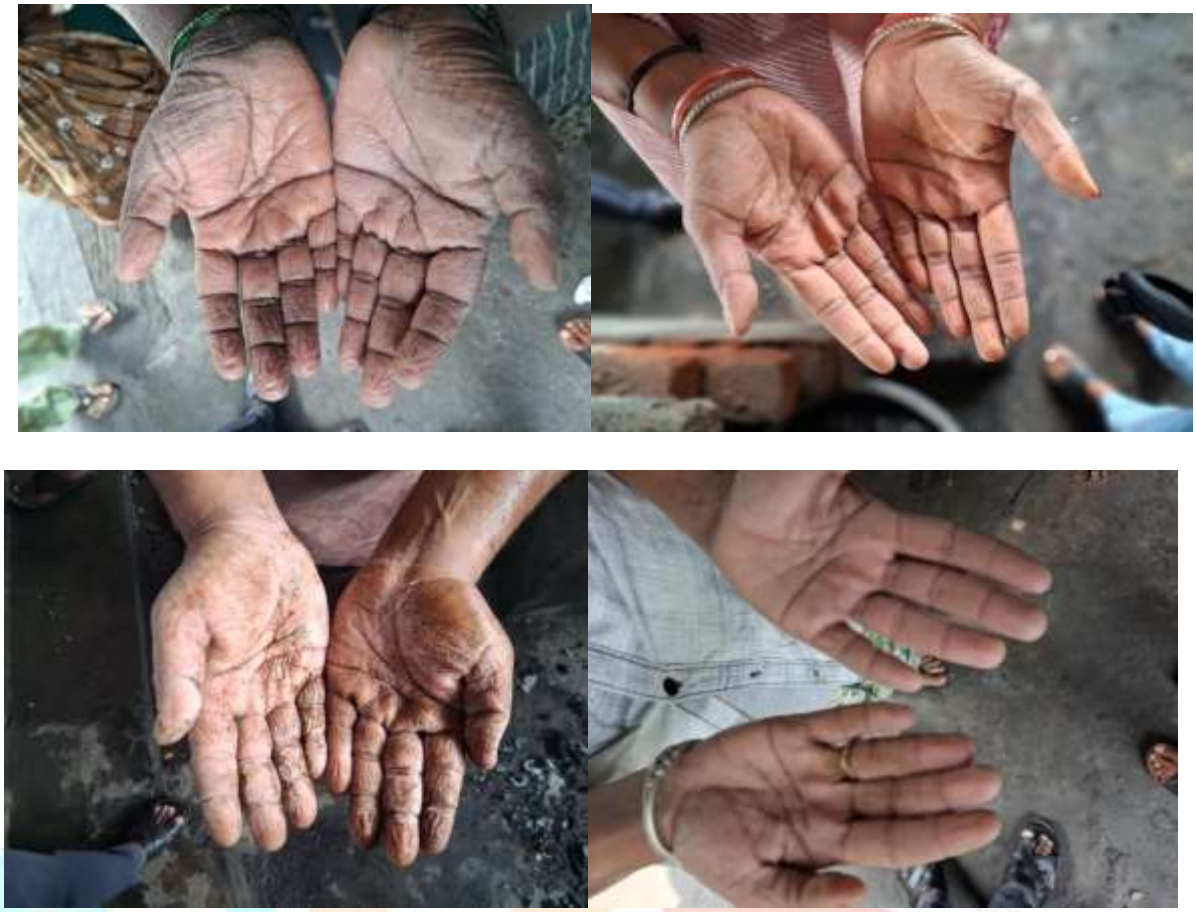


Fig 3.1 a. Images showing the results of before and after the application of cream

SCOPE FOR FURTHER STUDIES

The cream has shown the good results on the wounds, cracks and peel off skins of the users, so the irritation and patch test authentically can be done to the cream and also checking on the shelf life the product can increase the efficacy of the product and also it can serve the people who are in need of the healing cream in economical aspect and as the preservatives and chemicals percentage used in this product is considerably low it can be used on the skin without any hesitation