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"Formulation and Characterization of a Tamarind Seed Coat Mucilage Based Herbal Topical Spray"

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ABSTRACT:

Skin acts as a delicate shield, protecting our bodies from the outer world. It helps us stay safe, experience touch, and regulate our body temperature. As the largest organ in the human body, the skin is also responsible for protecting us from pathogens and hazardous substances. Skin care is vital for maintaining health and well-being. Natural and herbal medicines are becoming increasingly popular due to their gentleness, safety, and lack of harsh chemicals.

The Herbal Topical Spray is a water-based solution enriched with natural components such as tamarind seed extract, aloe vera, glycerin, and rose water. It is intended to soothe, moisturize, and protect the skin. Tamarind seed extract reduces inflammation and enhances wound healing. Aloe vera calms the skin, and glycerin keeps it hydrated.

This spray is simple to apply, non-sticky, and absorbs rapidly, making it ideal for daily use on irritated, dry, or sensitive skin. Herbal topical spray is a mild, chemical-free solution to promote healthy skin, particularly for individuals suffering from inflammation or minor skin concerns.

Keywords: Topical, Herbal, Formulation, Tamarindus indica, Spray, Characterization.

Introduction:

Skin regeneration is an intricate biological process that involves the repair and restoration of damaged skin tissues. It is essential for wound healing, restoring skin barrier function, and treating a variety of dermatological diseases. Conventional therapies frequently include synthetic chemicals, which might cause irritation or allergic responses. As a result, there is a rising interest in creating natural and biocompatible alternatives that promote successful skin healing while minimizing negative side effects.

Skin regeneration requires complicated physiological mechanisms that are essential for healing and preserving skin integrity. Conventional chemical therapies, while effective, frequently result in unpleasant responses. Herbal alternatives are becoming increasingly popular due to their natural efficacy and biocompatibility. Tamarindus indica seed coat mucilage (TSCM) is high in polysaccharides, which aid in moisture retention, film formation, and anti-inflammatory effects.

Natural polymers generated from plants have received a lot of attention due to their multifunctional use in topical preparations. Tamarind (Tamarindus indica) seed coat mucilage (TSCM) is a polysaccharide-rich biopolymer derived from tamarind seed coats that has outstanding film-forming, moisturizing, and mucoadhesive qualities. These properties make TSCM an attractive natural foundation for skin-care products aiming at improving moisture retention and providing a protective barrier to aid in tissue repair.

Despite separate evidence for the benefits of TSCM and these herbs, there has been no research into their combined use in a stable, easy-to-apply topical formulation such as herbal spray. The purpose of this study is to create and test a novel herbal spray formulation that includes tamarind seed coat mucilage and chosen herbal extracts to enhance skin regeneration. The formulation's physicochemical qualities, stability, and skin compatibility will be evaluated to determine its suitability as a natural, effective, and patient-friendly skin care product.

Health Benefits of Tamarind Seeds:

- **Rich in Antioxidants** – Help combat oxidative stress and reduce inflammation.
- **Promotes Heart Health** – May support healthy cholesterol and blood pressure levels.
- **Controls Blood Sugar** – Contains compounds that can help manage glucose levels.
- **Aids Digestion** – Known for its fiber and digestive enzymes that support gut health.
- **Antimicrobial Properties** – Effective against certain bacteria and fungi.

- **Improves Joint Health** – May reduce joint pain and stiffness due to anti-inflammatory effects.

3. Classification of herbal spray-

- Medicinal sprays-Respiratory relief sprays, Pain relief sprays, Wound healing sprays, Antiseptic sprays
- Personal Care Sprays- Facial mists/toners, Hair sprays, Body sprays
- Oral Care Sprays- Breath fresheners, Mouth antiseptic sprays
- Based on Base Formulation- Water-Based Sprays, Alcohol-Based Sprays, Oil-Based Sprays
- Based on Delivery System - Aerosol Sprays, Pump Sprays, Roll-on or Mist Applicators

Ideal Herbal Spray Properties -

- Safe and Natural Ingredients includes genuine herbal extracts, such as lavender, tea tree, peppermint, and chamomile. devoid of artificial scents, sulfates, parabens, and synthetic ingredients. Non-toxic and hypoallergenic.
- Practical and efficient accomplishes its specified goal (e.g., antibacterial, relaxing, deodorizing, refreshing) with obvious effectiveness. includes potent herbal ingredients that are well-known for their effectiveness, such as thymol, eucalyptol, and menthol.
- A Natural and Pleasant Fragrance mild, revitalizing aroma from herbal distillates or essential oils. It doesn't overpower or irritate the senses.
- Stable and Durable designed to keep its power over time.

Formulation Profile of Herbal Topical Spray:

Table No. 1 Formulation of Herbal Topical Spray.

Sr. No	Ingredients	Quantity
1.	**Tamarind seed extract**	**1ml**
2.	**Citric acid**	**1 ml**
3.	**Sodium benzoate**	**0.2 gm**
4.	**Rose water**	**3 ml**
5.	**Glycerin**	**2 ml**
6.	**Aloe vera juice**	**10 ml**
7.	**Purified water**	**Q. S.**

Method of Preparation of Herbal Topical Spray:

- Tamarind Seed Extract can be made by soaking 5 grams of powdered tamarind seeds in 50 milliliters of filtered water for four to six hours. Spend 30 minutes heating to 60 to 70°C. Allow 1 mL of the extract to cool, filter, and collect.
- Mix Base Ingredients: 2.5 mL of rose water, 1.5 mL of glycerin, and 7.5 mL of aloe vera juice should all be combined in a clean beaker. Make sure to stir thoroughly.
- Incorporate the Preservative and Extract: Include 0.1 g sodium benzoate and 1.0 mL tamarind seed extract. Blend until dissolved.
- pH adjustment: To check pH, aim for 5.5–6.5. Use lemon juice or diluted citric acid to adjust if necessary.
- Make Up Volume: 50 mL is the final volume after adding purified water. Thoroughly mix.
- Package and Filter: Pour the solution into a 50 mL spray bottle that has been sterilized. Put the appropriate label.

Formulated Sample of Herbal Topical Spray:

Fig. No. 1 Formulated Sample of Herbal Topical Spray.

Physical Evaluation Parameter and Results of Herbal Topical Spray:

Table No. 2 Physical Evaluation Parameter of Herbal Topical Spray.

Sr. No	Parameter	Observation
	Color	**Light brown**
	Oduors	**pleasant herbal aroma**
	State	**Clear, free-flowing liquid**
	Texture	**Smooth**
	Spread ability	**Uniform**
	Stability	**Stable at Room Temp.**
	Consistency	**Liquid (non-sticky)**
	Homogenecity	**Good**
	Skin Irritation Test	**No Irritation**
	Grittiness	**Non-Gritty**
	pH	**6.7**
	Color Stability	**No change for one month.**
	Washability	**Easily Washable**

Conclusion:

The herbal topical spray is made with tamarind seed extract, aloe vera juice, glycerin, and rose water, resulting in a natural skin care solution with multiple advantages. Tamarind seed extract has anti-inflammatory and wounds-healing qualities, and aloe vera soothes and moisturizes the skin. Glycerin functions as a humectant, retaining moisture, while rose water has a pleasant and aromatic effect.

This herbal spray provides a gentle, non-sticky application that is perfect for irritated or inflamed skin. Its natural ingredients work synergistically to enhance skin restoration, minimize redness, and help keep skin hydrated. Proper formulation, pH balance, and storage conditions guarantee that products remain stable and effective throughout time.

Overall, the herbal topical spray is a pleasant and chemical-free option for daily skin care. Regular use may aid in skin regeneration, alleviate discomfort from minor cuts or inflammation, and improve general skin health without the side effects of synthetic products.

Conflict of Interests:

The authors declare that they have no known competing financial interests or personal relationship that could have appeared to influence the work reported in this paper.

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