

Research on formulation and Evaluation of Polyherbal Acne Cream

Shivam R. Sonawane¹, Pradip R. Khairnar², Ashwini V. Tagad³,
Nitin B. Aher⁴

^{1,2,3,4}Student, Ashvin College of Pharmacy, Manchi Hill

Abstract:

My project deals with the topic titled as “**Formulation and Evaluation of Polyherbal Acne Cream**” Herbal cosmetics are the preparation are used to beautify and enhance the human appearances. The aim of the present project was to formulate and evaluate the acne cream containing plant extracts prepared Herbal acne cream was prepared using natural polyherbal ingredients. In this formulation of acne cream Aloe vera, Turmeric, Cinnamon, cucumber, Honey, Beeswax the cream was evaluated for various parameters such as appearance, pH, viscosity, Spread ability, Extrudability, Stability studies, foamability, washability, irritability and found to be contented with all required characterizations. Thus, this formulation can be used as an efficient cream for using if for the maintenance of healthy and glowing skin.

Keywords: Polyherbal acne cream, Antioxidant, Anti-microbial, Less Abrasive, Skin Exfoliate

Introduction:

Skin is one of the largest organs of the body. Skin functions as a protective wrapper, keeping everything beneath it safe from daily threats such as the harsh effects of sun, wind and pollution, germ filled grime. Skin is also a sensory organ, which indicates the health of an individual. Skin care is very important to make it healthy and fresh; there are so many market preparations for skin care. Skin care is at the interface of cosmetics and dermatology but skin care differs from dermatology, it does not require any medical professional every time. Cosmeceuticals are the future generations of skin care. The term cosmetic derived from Greek word 'Kosmeticos' which mean pertaining to cosmetics or beautifying substance or preparation. The word 'cosmesis' (Gr. Kosmesia) used for two things: the preservation restoration or bestowing of body beauty, the surgical correction of disfigured physical effect. Cosmetics are defined as the products used for the purposes of cleansing, beautifying, promoting attractiveness or alternating the appearance.



Fig No 1. Cosmetic product

In a world where skincare aisles overflow with promises of flawless skin and blemish-free faces, the search for an effective solution often feels like a daunting journey. Acne, a common skin condition affecting millions worldwide, knows no boundaries of age, gender, or ethnicity. From teenagers battling hormonal changes to adults grappling with stress-induced breakouts, the quest for a remedy remains relentless. Amidst this pursuit, herbal acne creams emerge as a beacon of hope, harnessing the ancient wisdom of botanicals to offer a holistic approach to skincare.

Herbal acne creams represent a departure from conventional skincare formulations laden with synthetic chemicals. Instead, they draw inspiration from nature's pharmacy, incorporating a rich tapestry of herbs renowned for their therapeutic properties. From soothing calendula to antibacterial tea tree oil, these botanical allies work synergistically to combat acne at its root while nurturing the skin with gentle care.

A Journey Through Nature's Garden

Step into the realm of herbal acne creams, and you'll embark on a sensory journey through nature's garden. Lavender's delicate fragrance transports you to sun-kissed meadows, while the cooling sensation of peppermint invigorates the senses. With each application, you'll experience the transformative power of plant-based skincare, as botanical extracts infuse your skin with vitality and radiance.

The Promise of Radiant Skin

In the quest for radiant skin, herbal acne creams emerge as steadfast allies, bridging the gap between nature and science with wisdom passed down through generations. With their gentle yet powerful formulations, they offer a beacon of hope to those navigating the tumultuous seas of skincare. So, embrace the healing touch of nature and embark on a journey towards clearer, healthier skin with herbal acne creams as your trusted companions.



Fig No 2. Acne Cream

Skin Cream:

Creams are those emulsions, which are either oil-in-water or water-in-oil type. Depending upon the main ingredients and purpose of this formulation, skin creams can be broadly classified as follows:

Types of skin creams:

1. Make-up creams (o/w emulsions)
 - Vanishing creams
 - Foundation creams
2. Cleansing creams (w/o emulsions)
3. Creams for winter (w/o emulsions) Cold creams
4. Creams for dry skin Moisturizing creams
5. All Purpose creams
6. Night creams
7. Skin protective and hand creams

Formulation of Skin Cream:

Ingredients used in skin cream include: bail

1. **Water:** One of the most widely used raw materials in the manufacture of cream is water. In cosmetics water is used as solvent for many ingredients of cosmetics. Water should be either deionised or distilled, if it has to be incorporated in cream formulations. Water is cheapest ingredient in creams, so it is good judgment to use purest water.
2. **Oil, Fates and Waxes:** Oil, fats and waxes and derivatives therefrom comprise an essential portion of creams. Oil may be of two types: mineral and glyceride.
 - A. Mineral oil: Mineral oil consists of hydrocarbons derived from petroleum oil. A number of mineral oils are used in cream formulation. Examples: Light liquid paraffin, Heavy liquid paraffin.
 - B. Glyceride oil: Glyceride oils are mostly vegetable oils. Examples of glyceride oils are almond oil, arachis oil, castor oil, coconut oil, olive oil etc.
 - C. Fats: A variety of fatty materials are used in cream preparations. The most common of these fatty acids are lauric, margaric, plamitic, stearic, saturated group. Oleic acid is liquid and most popular unsaturated fatty acid. More specially the oils most commonly used in other cosmetics are olive oil, almond oil, sesame oil, peanut oil, coca butter fat, mutton tallow, lard and beef stearine.
 - D. Waxes: Waxes used in creams and other cosmetics include beeswax, carnauba wax, ceresin, ozokerite japan wax and spermaceti. Of these beeswax and spermaceti are of animal origin, while carnauba, candelila and japan wax are from vegetable kingdom. Montan (a vegetable) wax and ozokerite (a mineral wax), are both derived from lignite of these waxes.
3. **Colours:** Colouring agents is infact, a generic term for any colour imparting substances. Most of natural colours have been replaced by coaltar colours so far as cosmetics are concerned. A few of the natural colours might still to be used. Examples of natural colours used in cosmetics are saffron, chlorophyll, cochineal.
4. **Emollients:** Emollients, also commonly referred to as moisturizers, are products that help to soften skin or to treat skin that has become dry. Most emollients are forms of oil or grease, such as mineral oil, squalene, and lanolin. They work by increasing the ability of the skin to hold water, providing the skin with a layer of oil to prevent water loss, and lubricating the skin.
5. **Emulsifying Agents:**
 - a. Inorganic Solid: Inorganic solid which forms emulsion include bentonite, colloidal, kaolin, hydrated lime or magnesia and other clay. When dispersed with water, their colloidal properties permit the formation of emulsion in water.

b. **Gums and Proteins:** Gums and proteins are used as emulsifying agent. These include gum tragacanth, karaya gum, gum Arabic, agar-agar, irish moss, alginate pectins, saponins, gelatin, casine, methyl cellulose and egg albumin.

6. Wetting Agent: Wetting agents are basically a type of surface active agents. These include soap, sulfonated oils, fatty alcohols, sulfates, sulfated fatty esters and amides, secondary alcohol sulfates and aryl alkyl sulfates.

7. Humectants: Humectants (or moisturizers) are important cosmetic ingredients allowing to prevent loss of moisture thereby retaining the skin's natural moisture. Some compounds also have the ability to actively attract moisture.

There is a large variety of very different compounds providing moisturizing effects including proteins, acids, polysaccharides, and various small molecules (e.g. glycerine, sorbitol, urea, aloe vera, olive oil, honey, babassu oil, grape seed oil, avocado oil, etc).

8. Perfumes: Perfume is a substance that imparts a scent or odour, including a sweet and pleasant smell. Examples of natural perfumes used in creams are:

- White blossoms,
- Rosy dreams,
- Orange blossom.

9. Some Functional Raw Materials: There are some materials which are incorporated in semisolid preparations for their specified functions and are used in variety of semisolid preparations. These materials are given below.

- a. Vitamins:** Vitamins play an important role in maintaining the physiological function of whole body. They also help us maintaining physiological function of skin. Vitamin A, vitamin B, vitamin C, vitamin E, nicotinamide, biotin etc. are generally used in formulations of creams.
- b. Amino Acids:** Amino acids are effective in helping recovery of dry and rough skin by moisturizing the epidermis system. There are several amino acids, but there are certain amino acids with which the body must be supplied such amino acids are called essential amino acids. Essential amino acids include histidine, arginine, tryptophan, methionine, etc.
- c. Anti-inflammatory Agents:** The term anti-inflammatory refers to something that reduces, or is against, inflammation. Examples of natural vitamins used in creams are green tea, turmeric, white willow, boswellia, cade oil etc

Ideal Properties of Cream

- Non-toxic
- Possess small
- Non irritating
- Non sticky
- It should be physically and chemically stable

Advantage of polyherbal cream

- After application cream, skin become soft clean and glow.
- Remove dead skin cells
- Provides smoother skin

- Improves the texture of skin.
- Better absorption of skin care products.
- Reduce the acne scars.
- Remove a flakes.
- Unlock the skin pores
- Reduce the radness of acne.

Disadvantages

- Irritation
- Dryness
- Scratches

Literature Review:

1) SHAILY SAINI: Formulation And Evaluation Of Aloe - Cucumber

Face Cream: A Detox to Summer Skin (International Journal of Creative Research Thoughts)

This study shows that the face creams are preparations that are semi-solid and used to lighten facial skin. The primary goal of this research project is to make face creams using various herbs and assess the effectiveness of the finished product. The face cream formulations undergo evaluation based on a range of criteria, including appearance, homogeneity, stability, pH, consistency, and organoleptic qualities. An emollient-rich lotion, cream emulsion, ointment, or balm that keeps skin hydrated is called a face moisturizer. Moisturizers replenish the skin's outer layers with moisture. Their primary advantage for the skin is that they seal it, retaining moisture and nutrients while shielding it from outside allergens. Pharmaceutical creams are used for a wide range of cosmetic functions, including moisturizing, cleaning, beautifying, and modifying appearance.

2) Kakade Sakshi Shivaji, Dr. Amol Navnath Khedkar: Formulation and Evaluation of Herbal Moisturizing Cream

(International Journal of Novel Research and Development)

Herbal cosmetics are concoctions meant to enhance one's looks. Our primary objective is to create a herbal cream with several uses, such a moisturizer that lessens skin irritation and acne. A plant or portion of a plant prized for its fragrant therapeutic qualities is called a herb. A semi-solid mixture called moisturizer is applied to the skin to prevent wrinkles and lessen the likelihood of skin issue. We used herbal substances including aloe vera, neem, Tulsi, and cucumber in our manufacture. Beeswax, liquid paraffin, methylparaben, borax, distilled water, rose oil, dimethyl sulfoxide, neem, Tulsi , and cucumber extracts were used to make the cream. In the conventional Indian medical system, neem and Tulsi are well-known for their therapeutic properties.

Herbs like Cucumber extract and aloe vera make great moisturizers and boost skin moisture. neem encourage the healing of wounds, papaya lowers wrinkles and eliminates dead skin cells, and Tulsi helps to naturally boost immunity. It has been discovered that amla turmeric has antioxidant and antiaging qualities. The cream was made with inexpensive materials and techniques, which makes it reasonably priced.

3) Jayshree R. Aate, Dr. Satish Kosalge, Shivani V. Kodape and Madhuri Khaire : Semisolid formulation of Cucumber and Almond (International Journal of Advanced Research in Biological Sciences)Volume 9, Issue 7 -2022

There are so many creams available on the market that you might not know which one is best for your skin type. A very good home cure for skin issues is to make a cold cream from all-natural components. Low socioeconomic groups in both urban and rural communities may benefit from the recent surge in the use of natural products in the prevention and treatment of oral disorders. Herbs used in cosmetics include cucumber, almond, and other plants. Skin care has always been a human necessity. Younger people tend to have smooth, supple skin, but this picture-perfect appearance is largely due to a structural protein called collagen.

4) Kartiki U. Jadhav, Manisha Kale Mam : Review on Cucumber Lotion as Skin Care Product (International Journal of Research Publication and Reviews)

There has been awareness among people regarding the use of plants for the basic need of healthy, beautiful skin since ancient times. Cucumber is one of the plants; it goes by several colloquial names, including Cucumber sativus kakari, khita, and dosa kalla. Cucumber lotion is classified as a product for skin care. Products for beauty or skin care are used to clean and brighten the skin. Cucumber lotion is an ayurvedic and herbal product that is safe for all skin types. Planning and evaluating a natural cream or lotion for remedial purposes using locally grown ingredients is the aim of this endeavour. Due to its natural, non-poisonous composition, cucumber lotion has a semisolid dose form and reduces hypersensitive reactions.

5) Blessy Jacob , Dona Mohammed 2, Likitha B.N. Vineeth Chandy : Preparation and Evaluation of Herbal Moisturizing Cream (International Journal of Pharmacy and Pharmaceutical Research)

It is hard to avoid using cosmetics in the present society because they have become so necessary. The increase in social gatherings and events has led to a sharp rise in demand for them. The cosmetics industry has grown steadily in several emerging nations in recent years. Numerous artificial chemicals present in personal hygiene products have been connected to adverse health outcomes in users, such as cancer. Some of the drugs might contain neurotoxins, which are reproductive toxins that have been demonstrated to affect brain development and reproduction. The use of herbal cosmetics has become a viable solution for this modern problem. Generally speaking, "herbal cosmetics" refers to natural cosmetics made from raw or extracted herbs that don't have any negative effects. They have no harmful effects and provide the body with nutrients and other helpful minerals. One type of herbal cosmetic is herbal moisturizer. These are semi-solid treatments designed to prevent wrinkles and lessen the chance of skin problems. They work to enhance and adorn people's appearances. The research's objective was to create and assess the herbal moisturizing lotion. Dried beetroot powder and cucumber extract are the herbs used in the recipe. The irritancy, washability, pH, viscosity, phase separation, and spread ability of the moisturizing cream formulation were assessed. Overall, the investigation yielded satisfactory results. The study's findings, cucumber extract's ability to moisturize skin was investigated. We may conclude that cucumber extract improves skin moisture and works well in cream formulations as a moisturizing ingredient.

6) Saurabh Rajak and Shashikant Maury : Review On Formulation And Evaluation Of Herbal Face Cream (World Journal Of Pharmacy And Pharmaceutical Sciences)

Aloe vera. Amla and cucumber peel are medicinal plants that have been used for centuries in a variety of herbal remedies, including homeopathic, Siddha, and Ayurvedic. Aloe vera gel, or the mucilaginous tissue found in the heart of aloe vera leaves, is used in cosmetics and certain pharmaceutical items. Anthraquinone is not present in aloe vera gel. They are in charge of aloe's potent laxative effects. Nevertheless, Anthraquinone may be present in total leaf extract. Aloe vera is composed of 75 potentially active constituents such as Vitamins, Enzymes, Minerals, Sugars, Saponins, and Amino acids. Amla contains Amino acids like glutamic acid, proline, and Aspartic acids, along with Protein and Minerals. Cucumber

peels are abundant in fiber and minerals like magnesium, potassium, and silica. Silica plays a crucial role in maintaining the health of muscles, bones, and tendons, while also enhancing skin hydration, complexion, and vision.

Aim and Objectives:

Aim:

To formulate and evaluate polyherbal acne removal cream

Objectives:

- To evaluate the safety, efficacy and quality of polyherbal acne removal cream
- To evaluate the cleansing, nourishing ability of polyherbal acne removal cream
- To evaluate the a cosmetic polyherbal cream for glowing skin by using natural herbal ingredients.
- To overcome the skin problem by using herbal ingredients.
- To get proper effect of herbal formulation.
- To reduce facial problem.
- To reduce the side effects after using chemicals facial formulation.
- To increase the maximum use of naturally occurring herbal ingredients.
- To minimize the use of chemicals products.

Plan of work:

The main plan of work was to formulate and evaluate of Polyherbal Acne removal Cream using a natural herbal ingredient which does not cause side effect and adverse effect.

For a preparing Polyherbal Acne removal Cream we use herb is:

1. Turmeric powder
2. Cinnamon powder
3. Aloe vera gel
4. Honey
5. Cucumber gel

Material and method:

Selection of Herbs

1. **Turmeric powder:** Has anti-inflammatory and antibacterial properties, helping to reduce redness and swelling associated with acne.
 - **Biological Source:** It is obtained from the rhizome of herb *Curcuma longa*.
 - **Family:** Zingiberaceae
 - **Chemical Constituents:** Turmeric powder is about 60–70% carbohydrates, 6–13% water, 6–8% protein, 5–10% fat, 3–7% dietary minerals, 3–7% essential oils, 2–7% dietary fiber, and 1–6% curcuminoids.^[9] The golden yellow color of turmeric is due to curcumin.

The rhizomes are used fresh or boiled in water and dried, after which they are ground into a deep orange-yellow powder commonly used as a coloring and flavoring agent in many Asian cuisines, especially for curries, as well as for the dyeing characteristics imparted by the principal turmeric constituent, curcumin.



Fig No 3. Turmeric

2. Cinnamon powder:

Contains antimicrobial properties that can help combat acne-causing bacteria.

- **Biological Source:** Cinnamon is a spice obtained from the inner bark of several trees from the *Cinnamomum zeylanicum*.
- **Family:** Lauraceae
- **Chemical Constituents:** Cinnamon, cassia, cinnamon twig, cassia aromaticum and cassia bark.
- **Synonyms:** Cinnamon, cassia, cinnamon twig, cassia aromaticum and cassia bark.

The source of cinnamon bark and leaf oils, is an indigenous tree of Sri Lanka, although most oil now comes from cultivated areas. *C. zeylanicum* is an important spice and aromatic crop having wide applications in flavoring, perfumery, beverages, and medicines.



Fig No 4. Cinnamon

3. Aloe vera gel:

Soothes irritated skin, reduces inflammation, and promotes healing.

- **Family:** Liliaceae
- **Biological Source:** dried juice of leaves of aloe barbadensis (curacao aloe) Aloe perryi (socotrine aloe)
- **Chemical constituents:** Barbaloin, Aloe-emodin, B-barbaloin, isobarbaloin, Aloe barbendis - (22% barbaloin), Aloe vera - (3.5-4% barbaloin), Aloesin- Resin present which gives purgative, action Aloctine- Increase removal of dead cells from skin
- **Use:** Purgative, in cosmetics

The plant species bearing the same name yields the aloe vera that we apply topically in over-the-counter (OTC) gels. Aloe actually comes in a variety of forms; an estimated 420 distinct species exist Trusted Source. For skin disorders, aloe barbadensis Miller is the herb that is most frequently utilized. The gel-like material found inside the plant's leaves is used to make topical gels, such as aloe vera gel, in

conventional medicine. You can also utilize the leaves straight out of the package by breaking them apart and extracting the gel.



Fig No 5. Aloe vera

4. Honey:

Acts as a natural Anti- bacterial agents and helps moisturize the skin.

- **Family:** Apidae
- **Biological Source:** Sugar secretion deposited in honey comb by bees, *Apis mellifera*
- **Chemical constituents:** 35% (± 3 percent) fructose 45 percent (± 5 percent) and sucrose about 2 percent Proteins and pollen grains found in honey Contains crystallized dextrose is called as Granulated honey Heating of honey serves the purpose of minimizing the granulation
- **Uses:** Demulcent, Sweetening agent
- **Synonyms:** Madhu, Mel

Additionally, honey's anti-inflammatory qualities can help with skin disorders like psoriasis and acne. Honey is really good for your skin because it helps keep it moisturized. The special stuff in honey lets it go deep into your skin and make sure all the layers stay hydrated. That's why your skin ends up looking smoother and softer, with a nice glow.



Fig No 6. Honey

5. Cucumber gel:

Contains antioxidants and anti-inflammatory properties that help calm and hydrate the skin.

- **Family:** Cucurbitaceae
- **Biological Source:** Cucumis sativus
- **Chemical constituents:** It is made up of 99% water, 4% carbs, 1% protein, and very little fat.
- **Uses:** helps the skin eliminate dullness, dryness.

Cucumber helps with excessive oils, dryness, and blocked and noticeably enlarged pores because it is packed with vital nutrients, minerals, and antioxidants. Furthermore, its high water content increases skin hydration levels, resulting in a naturally radiant complexion. It lessens the presence of black spots. Cucumber efficiently treats dark spots with its astringent, brightening, and cooling effects. Additionally, it increases the skin's collagen levels, which aids in cell renewal.



Fig No 7. Cucumber

Details of Herbs

Sr. No	Herbs	Family	Uses
1	Turmeric powder	Zingiberaceae (Curcuma longa)	Anti-inflammatory
2	Cinnamon powder	Lauraceae (Cinnamomum zeylanicum)	Antimicrobial
3	Aloe vera gel	Liliaceae (aloe barbadensis)	reduces inflammation
4	Honey	Apidae (Apismellifera)	Moisturize the skin.
5	Cucumber gel	Cucurbitaceae (Cucumis sativus)	Eliminate dullness

Table No.1: Details of Herbs

Material Used for Making for Herbal Cream:**Formula:**

Sr. No	Ingredient	Quantity(30)	Quantity (100)
1	Turmeric powder	4gm	20gm
2	Cinnamon powder	2gm	10gm
3	Aloe vera gel	7gm	23gm
4	Honey	1gm	5gm
5	Cucumber gel	7gm	20gm
6	Beeswax	8gm	20gm
7	Glycerin	1gm	2gm

Table No 2: Formula**Procedure:**

- In a double boiler, melt the beeswax.
- Once melted, add the cucumber gel, aloe vera gel, and glycerin and stir well.
- Gradually add the turmeric powder and cinnamon powder to the mixture, stirring continuously to ensure even distribution.
- Remove the mixture from heat and let it cool slightly.
- Add the honey and stir well to combine.
- Pour the mixture into a clean sterilized container.
- Allow the cream to cool completely before sealing the container.

Evaluation parameters:

Following are the evaluation parameters were performed to ensure superiority of prepared polyherbal cream.

1. Colour: Caramel
2. Odour: Characteristic odour
3. Texture/ Appearance: Smooth
4. Nature: Semi solid
5. Consistency: Good
6. ph: 4.98

ph of the prepared polyherbal cream was evaluated by using digital ph meter.

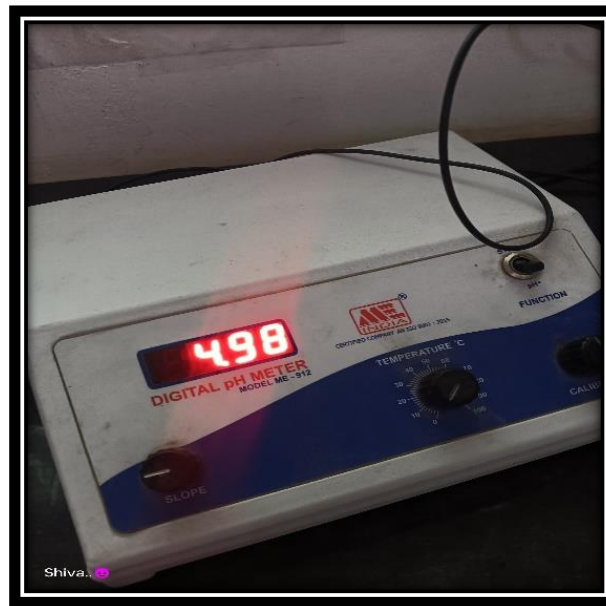


Fig No 8. ph meter

1. Washability: Easily washable

little quantity of cream was applied over the skin and washed with water.

2. Nature of skin after wash: Smooth

After washing skin with water, it was checked that nature of skin and colour difference skin.

3. Irritability: Non irritant

It was evaluated by patch test. It is not verified test but as per mentioned on marketed preparations label, had performed this test also. Little quantity of the cream was applied on the surface of skin and kept it as it is for few minutes.



Fig No 9. Irritability test

1. Grittiness: Small gritty particles

Grittiness was checked manually.

2. Moisture content: No

As we use only solid material that is in powder form so no moisture content is there which can any micro-

bial contamination.

3. Cleansing effect: Good

The preparation is checked for its cleansing effect by checking if it removes the dirt/ grime when rubbed into the skin and then washed with water.



Fig No 10. Cleansing effect

4. Ease of use: Yes

It is determined that how easily users can use the product. We determined it by using the small amount of product as trial purpose.

Evaluation table:

Sr. No	Test	Result
1	Colour	Caramel
2	Odour	Characteristic odour
3	Texture/Appearance	smooth
4	Nature	Semi solid
5	Consistency	Good
6	ph	4.98
7	Washability	Easily washable
8	Nature of skin after wash	Smooth
9	Irritability	Non irritant
10	Grittiness	Small gritty particles
11	Moisture content	No
12	Cleaning effect	Good
13	Ease of use	Yes

Table No 3: Evaluation table

Results:

The formulation herbal cream was evaluated at different parameters. All the organoleptic properties were checked visually such as colour, odour, consistency, and texture. As a result, the colour observed was

Caramel colour, no bad smell occurred from formulation and the consistency of the formulation was found suitable as required to apply on the skin.

Washability and cleansing properties of Aloe vera was found to be good, and it is easily removed by washing with normal water. It left a smooth feel on the skin after washing and no dryness was observed. No redness, no irritation or any dermatological effects were observed on skin during irritancy testing.^[1]

Conclusion:

From the above results, it concluded that the prepared herbal based cream formulation can be safe to use and aloe vera gel used as cleansing agent, and reduce inflammation. As most of the ingredients used are natural ingredients, so chance for side effect and irritation are less. The prepared cream was evaluated using various parameters and was found to be satisfied with the application on the skin to make it healthy and glowing without any side effect. Since, curcumin is a strong antioxidant, antifungal agent and cinnamon is anti-inflammatory and antiseptic agent, they are both incorporated into the formulation which increases the efficiency of the product.

In comparison to other cosmetic products available in the market, natural and herbal cosmetics are easy, safe and effective to use. One of the main reasons for herbal products use is that they can be used for all skin types. The major use of herbal products is for health promotion and therapy for serious skin conditions. However, usage of traditional remedies increases when conventional products are ineffective or may cause harmful effects. The use of polyherbal acne removal cream gives effectiveness and healthier skin type. The prepared formulation was suitable to skin and was evaluated using various parameters. The formulation has passed all the tests included in evaluation.

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