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FORMULATION AND EVALUVATION IN ETHANOLIC EXTRACT OF SIDA ACUTA HERBAL FACE CREAM

***Dr. A. Alinda Thomaseena, N. Gopika, S. Priyanga, S. Selvaganapathi, P. Vijayalakshmi**

G.P Pharmacy College, Mandalavadi.

***Corresponding Author: *Dr. A. Alinda Thomaseena**

G.P Pharmacy College, Mandalavadi.

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1. INTRODUCTION

1.1 DEFINITION

Creams are semi-solid dose forms used topically for medical, preventative, or cosmetic purposes on the skin, eyes, or mucous membranes such the nasal, vaginal, or rectal surfaces. Either water dispersed in oil (w/o) or oil dispersed in water (o/w) make up these adaptable semi-solid emulsions. These formulations are carefully prepared for external use and strengthened with emulsifying ingredients to guarantee stability.

They are made to offer skin therapeutic benefits, including protection, hydration, moisturization, and effective active ingredient administration.[1]

The largest organ in the body, the skin, is made up of minerals, water, protein, and lipids. It serves as a barrier, keeping out germs and controlling body temperature. The skin's nerves aid in the detection of temperature changes.

The epidermis, dermis, and hypodermis are the three layers that make up the skin. Skin cells contain a protein called keratin, which holds cells together to create a strong framework and preserve the skin's structure.[2]

Creams are categorized according to their kind of emulsion, characteristics, and function.

1.1.1 Emulsive makeup creams

• Cream that disappears
• Cream for foundation.

1.1.2 Emulsion-free cleaning products

• Lotion and cream for cleaning

1.1.3 Emulsion-free winter creams

• Cold cream
• Hydrating cream

1.1.4 Multifunctional Creams

• General cream
• All-purpose cream

1.1.5 Products for Hand and Body Care

- All-purpose Herbal Cream.[3]

1.2 THE PERFECT CREAM PROPERTIES

- Improved application simplicity and Spreadability.
- A better look.
- Texture of melting or liquefaction.
- The activity of flushing and refining pores.
- Formation of emollient film.
- Avoiding dryness.[4][5]

1.3 HERBAL CREAM

- Herbal creams are cosmetic preparations that combine one or more herbal substances with synthetic compounds as a basis to offer cosmetic benefits.
- Because of the advantageous qualities of the herbal ingredients, these creams provide several benefits, including healing, smoothing, conditioning, and improving look. These characteristics include antioxidant activity, anti-aging benefits, and more.
- To cure a range of skin disorders, the current study set out to create a herbal cream with antifungal, antibacterial, and anti-acne qualities in addition to moisturizing, nourishing, and lightening effects.

- Since ancient times, herbal creams have been utilized as natural solutions for a variety of skin care products and cosmetic applications. They offer a holistic approach to skincare by utilizing the therapeutic qualities of plant-based compounds to nourish, protect, and revitalize the skin.[6]

1.4 TYPES OF HERBAL CREAM

There are two primary categories of herbal creams.

1.4.1 Oil-in-Water (O/W) Cream: This kind is made up of tiny oil droplets scattered across a stream of water. Here, water serves as the main glue, and oil is dispersed throughout in the form of microscopic droplets. Oil-in-water (O/W) creams are the name given to this kind of composition.

1.4.2 Water-in-Oil (W/O) Cream: This kind has tiny water droplets scattered throughout an oily phase. Water is present in the form of tiny drips, but oil is the primary substance that holds everything together. We refer to this kind of mixture as water-in-oil (W/O) cream.[7][8]

1.5 HISTORY OF HERBAL CREAM

Herbal creams have a long and illustrious history, dating back to traditional medical procedures that used natural plant ingredients to treat a range of illnesses. Evidence of the usage of plants in topical medicines can be found in ancient cultures like Egypt, China, India, Greece, and Rome, which stretch back thousands of years.

Using botanical extracts, the Egyptians were among the first to produce topical ointments and lotions. To create salves that aided in the healing of burns, wounds, and infections, they combined various plant oils with plants like aloe Vera. Even Cleopatra was well-known for using herbal substances in her skincare regimens.[9]

One of the oldest and most extensive natural healing systems in India is the Ayurvedic system, which has been practiced for more than 5,000 years of the most extensive and traditional natural healing systems. Turmeric, sandalwood, neem, tulsi, and mint were among the ingredients used by Ayurvedic practitioners to make herbal treatments. These formulations were used to treat a variety of illnesses, reduce skin inflammation, and promote wound healing. Products called cosmetics are frequently used to enhance and cleanse the skin. This word "cosmetics" comes from the Greek word "kosméticos," which means "to adorn." Herbal cosmetics are a category of products created especially to nourish and moisturize the skin while improving and beautifying human appearance.[10]

1.6 NATURAL INGREDIENTS

Herbs, flowers, roots, fruits, and essential oils are just a few of the many plant-based substances used in the formulation of herbal lotions. Aloe vera, chamomile, calendula, lavender, turmeric, neem, and green tea are among the common botanicals found in herbal creams; each is valued for its own medicinal properties.[11]

1.6.1 Benefits of Therapy

Herbal creams' many therapeutic advantages for the skin are what make them so appealing. Rich in vitamins, antioxidants, and phytonutrients, these creams aid in the fight against free radicals, lower inflammation, and encourage skin regeneration and repair. Herbal cream can be used to treat a variety of skincare issues, from dryness and irritation to acne and aging symptoms, because many botanical extracts have antibacterial, anti-inflammatory, and calming qualities.[12]

1.6.2 Gentle and safe formulations

Herbal lotions' mild and secure formulas are among their main benefits. Natural, plant-based ingredients are given precedence in herbal creams over traditional skincare products. They are therefore perfect for people with sensitive skin or those looking for substitutes for potentially irritating or allergic elements included in popular cosmetics.[13][14]

1.7 CREAM COMPOSITION

The composition of creams typically includes.

1.7.1 Water phase: The water phase hydrates and serves as a solvent for substances that are hydrophilic, or soluble in water.

1.7.2 Oil phase: Provides emollient qualities and acts as a vehicle for substances that are Lipophilic, or soluble in oil. Emulsifiers: Prevent phase separation and stabilize the water-oil contact.

1.7.3 Active ingredients: Offer therapeutic benefits include moisturizing, anti-aging, antioxidant, and anti-inflammatory qualities.

1.7.4 Excipient: Improve the cream formulation's viscosity, stability, texture, and sensory qualities.[15]

1.8 IDEAL PROPERTIES OF FACE CREAM

- Increased Spreadability and Application Simplicity
- Improving Appearance
- Texture Melting or Liquefaction Emollient Film Formation
- Pore Refining and Flushing Action,
- Dryness Prevention,
- Softening, Lubricating, and Protecting Properties.[16]

1.8.1 Advantages of creams

Easy Application: Creams are usually spreadable and smooth, which makes it simple to apply them to the skin without leaving a greasy residue or causing irritation.

Targeted distribution: Creams are useful for treating localized disorders including psoriasis, acne, and eczema because they enable the precise distribution of active chemicals to skin regions.

Moisturizing Properties: Glycerin and hyaluronic acid are two examples of moisturizing compounds included in many lotions.

Versatility: A broad variety of active substances can be used into cream formulations, enabling customization to satisfy skincare requirements or therapeutic objectives.[17]

Stability: Creams that are properly made can last a long time without losing their effectiveness. In contrast to other formulations such as gels or lotion they are less susceptible to oxidation or deterioration. Occlusive nature Creams work well to hydrate the face, but because of their occlusive qualities, they can sometimes cause pore congestion and acne flare-ups, especially in people with oily or acne-prone skin.

Greasy Residue: Certain creams may leave the skin feeling greasy or sticky, which can be uncomfortable, particularly in hot and muggy weather. This might discourage people from utilizing them frequently.[18]

Sensitivity Potential: Careful ingredient selection is necessary since certain people may experience allergic reactions or skin sensitivities to common cream ingredients including scents, preservatives, and emulsifiers.

1.9 ADVANTAGES OF HERBAL SYSTEM OF MEDICINES

- Reduced possibility of adverse effects
- Extensive accessibility
- Effectiveness of chronic medications
- Their low-cost effectiveness adds to their allure.
- Herbal medicine effectively enhances the body's natural detoxification process.

2.0 DISADVANTAGES OF HERBAL SYSTEM OF MEDICINES

- Dosing in bulk.
- Poor stability in hepatic metabolism, increased acidic etc.
- Large molecule size restricts passive diffusion absorption.
- A significant quantity of raw materials is needed to process the medication.
- A partial or complete loss of medicinal action results from the separation and purification of components from the overall herbal extract.
- bioavailability Because of the chemically similar components in plant extract, the natural synergy is frequently These restrictions result in a lower therapeutic index of plant active components due to decreased loss. As a result, creating a unique medication delivery mechanism for herbal drugs has received a lot of action

2.1 NATURALS OF SKINS

Three layers make up the skin:

- epidermis (50–100 μm),
- dermis (1–2 mm),
- hypodermis (1–2 mm)

Stratum corneum, the epidermis' outermost layer, is the barrier to percutaneous absorption. The stratum corneum serves as a barrier against permeability to the environment, prevents water loss, and offers defense against microbes and abrasive action.

The stratum corneum is a multilayer layer of flat polyhedral, 2–3 μm thick, non-nucleated cells called corneocytes that ranges in thickness from 10–20 μm. The main component of corneal cells is insoluble bundceratin, which is encased in a cell envelope held together by biovalently attached lipids and cross-linked proteins.

Membrane junctions called Corne desmosomes link corneocytes and support the cohesiveness of the stratum corneum. Lipids that are mostly produced by the exocytosis of lamellar structures during the final differentiation of the keratinocytes make up the intercellular gap between the corneal cells. A healthy skin barrier function depends on these lipids.[6]

Ten to twenty layers of cells make up the epidermis. Additionally, Langerhans cells, which are involved in antigen presentation and immunological responses, and melanocytes, which are involved in skin pigmentation, are found in this pluristratified epithelium. Like other epitheliums, the epidermis gets its nourishment from the dermal vascular network.

The stratum corneum's renewal is governed by intricate regulatory systems of cellular differentiation, and the epidermis is a dynamic structure. Studies of the epidermal reactions to disruptions of the skin barrier, such as.

1. removing skin lipids using apolar solvents
2. Physically stripping the stratum corneum with adhesive tape
3. causing irritation chemically.[11]

In recent decades, medications have been administered to the human body by a variety of routes, including oral, sublingual, rectal, parental, topical, and inhalation. Topical delivery is the process of applying a drug-containing formulation directly to the skin to treat a cutaneous disorder or the cutaneous symptoms of a general disease (like psoriasis) with the goal of containing the drug's pharmacological effects on the skin's surface or within the skin. Although foams, sprays, medicated powders, solutions, and even medicated adhesive systems are used, semisolid formulations predominate in the topical delivery system.[2]

2.1.1 Dermis

The dermis is elastic and hard. It is made of connective tissue, and the matrix is made up of collagen and elastic fibers. When the skin is overstretched, elastic fibers rupture, leaving behind permanent striae, or stretch scars, which can appear in obese and pregnant women. Wrinkles appear because of the skin's deteriorating collagen fibers, which bind water and give it its tensile strength. The primary cells in the dermis are mast cells, macrophages, and fibroblasts. Its deepest layer is composed of various amounts of adipose (fat) tissue and areolar tissue.

2.1.2 Subcutaneous gland

These are made up of cells called secretory epithelial cells that come from the same tissue as hair follicles. They are found in the skin of every region of the body, with the exception of the palms of the hands and the soles of the feet, and they release sebum, an oily substance, into the hair follicles. They are particularly prevalent in the skin of the face, axillae, groins, lips, eyelids, nipple, labia minora, and glans penis. These areas have sebaceous glands that secrete sebum straight onto the skin and are not dependent on hair follicles.[12]

2.2 SKIN FUNCTIONS

The skin carries out the following tasks.

2.2.1 Defense: The skin's Langerhans cells, which are a component of the adaptive immune system, act as an anatomical barrier to protect the body from infections and harm between the internal and exterior environments.

2.2.2 Sensation: Consists of a range of nerve endings that respond to pressure, vibration, heat and cold, touch, and tissue damage; refer to haptics and the somatosensory system.

2.2.3 Heat regulation: Because the skin has a blood supply that is significantly more than it needs, energy loss by radiation, convection, and conduction can be precisely controlled. While constricted blood arteries significantly lower cutaneous blood flow and retain heat, dilated blood vessels improve perfusion and heat escape.

2.2.4 Evaporation control: The skin acts as a semi-impermeable, relatively dry barrier to prevent fluid loss. The significant fluid loss in burns is a result of this function being lost.

2.2.5 Communication and appearance: People can judge our emotions, physical condition, and attractiveness.

2.2.6 Storage and synthesis: Serves as a location for the storage of water and lipids and a mechanism for the synthesis of vitamin D through the effect of UV on certain skin regions.[13]

2.3 SKIN DISEASES

2.3.1 Vitiligo

Areas of skin that have Vitiligo become white because they no longer have their natural pigmentation. It is widespread, affecting roughly 1% of people worldwide. Melanocytes are the cells that produce melanin, the pigment that gives your skin its typical color.

2.3.2 Scabies

Human scabies mites are the source of scabies, a widespread and extremely unpleasant skin disorder. Although it can impact people of any age, young people and the elderly are more likely to experience it. Smaller than a pinhead, the mites that cause scabies are microscopic parasites. Scratching marks and red, scaly patches are common features of the scabies rash, which can later get infected and develop tiny pus spots.

2.3.3 Rosacea

Rosacea is a common rash that typically affects middle-aged people and appears on the central portion of the face. The nose, forehead, chin, and cheeks all remain red after a propensity to flush rapidly. Although the exact etiology of rosacea is unknown, many believe that the condition is caused by the face's blood vessels dilatation.

2.3.4 Psoriasis

About 2% of people have psoriasis, a prevalent skin condition. It affects both men and women equally, at any age, and has an unpredictable cyclical pattern. It does not cause skin scarring and is not contagious. The skin is an intricate organ composed of multiple layers.

2.3.5 Melanoma

A malignancy of the skin's pigment cells is called cutaneous malignant melanoma. The prognosis is typically favorable if treatment is received early. It's not communicative. The Greek word "meals," which means black, is where the name "melanoma" originates. The black pigment known as melanin is what gives skin its inherent color.

2.3.6 Atopic Eczema, or Eczema

Atopic eczema is a skin disorder that causes inflammation. Conditions like eczema, asthma, seasonal rhinitis, and hay fever are referred to be atopic because they frequently have a genetic foundation. Changes in the epidermis' outermost layer, such as redness, blistering, oozing, crusting, scaling, thickening, and occasionally pigmentation, are referred to as eczema.[14]

2.4 CREAMS CLASSIFICATION

Every skin cream can be categorized using a different method.

- Based on functions, such as massage, foundation, washing, etc.
- Based on certain attributes, such as chilly creams, disappearing creams, etc.
- Based on the type or nature of emulsion.

Cream types based on their purpose, unique qualities, and emulsion type:

- O/w emulsion makeup cream: a) Vanishing creams. b) Creams for the foundation.

- Cleansing lotion (without emulsion), cleansing milk, and cleansing cream
- Winter cream (without emulsion): a) Moisturizing or cold creams.
- General and all-purpose creams.
- Massage and night creams.
- Cream for protecting the skin.
- Creams for the hands and body.

2.4.1 Cream for makeup

These are primarily o/w emulsions. It is a cream-based treatment that leaves the skin feeling nourished and smooth (either bright or stain-matte) on the skin. It gives skin a dewy sheen, nourishes it, and is essentially sweat-resistant.

Vanishing creams get their name from the fact that, when applied to the skin, they appear to vanish. Stearic acid is the basis for these compositions. The cream has a drying impact on the skin and leaves behind a tacky, dry residue after use. These are utilized for this reason, especially in hotter areas where sweating occurs on the skin.

2.4.2 Creams for foundation

These creams act as the base for makeup. It serves as a base that adheres when makeup powder is applied. They give skin that is neither too dry nor too oily an emollient effect as well as environmental protection. It serves as a base that adheres when makeup powder is applied. They give skin that is neither too oily nor too dry an emollient effect as well as environmental protection. It is multicolored makeup that is applied on the face to cover imperfections and alter skin tones while producing a uniform, even color that resembles the complexion.

2.4.3 Creams for cleaning

These creams are intended to clean the body and promote personal cleanliness and beauty, both of which are critical for cosmetics. Makeup, oil, and surface grime can be removed from the face and neck mostly with cleansing creams or lotions.

2.4.4 Creams for the winter

These are w/o formulations, meaning that there will be more oil than water in the mixture. The primary usage of these creams is for dry, cracked skin. Cold cream: Also referred to as a hydrating cream or moisturizer. The emollient properties of cold cream are essential. When used, it ought to provide a cooling feeling and leave the skin's oil layer non occlusive.

2.4.5 General and all-purpose creams

These days, more people utilize these creams than ever before. These creams spread easily on the skin and have a little oily but non-greasy texture. Additionally, this can be applied as night cream, nourishing cream, protective cream, to prevent or treat sunburn, or to areas of skin that have become tough.

2.4.6 Massage or night creams

These creams are mostly used to cure dry skin or to nourish the skin. Night creams are primarily defined as creams that are typically applied to the skin and left on for a few or many hours during the night. Massage cream is a type of cream that produces emollient effects by massaging the skin.

2.4.7 Creams that preserve the skin

These thick-bodied, silky creams are designed to give the skin a consistent, imperceptible protective film barrier. It aids in preserving the skin's protective layer against substances that could cause irritation (such as contact dermatitis and occupational dermatitis). Preserves the equilibrium between normal and combination skin and fortifies the skin's inherent qualities.

2.4.8 Creams for the hands and body

One of the earliest areas to exhibit aging symptoms is hands. We frequently wash our hands to remove moisture during the day. Using cream keeps the skin looking youthful while also protecting and softening it. It makes sense to use hand lotions that replenish existing oil because the skin on our palms and fingers requires it to be supple and to keep it from drying out and cracking. Compared to other body parts, the hands receive the most use. [15]

2. LITERATURE REVIEW

1. GITANJALI JIJABRAO PATIL, DEVESHPRAVINKUMAR BHAVSAR et.al., (2025)

Because of their natural components, medicinal benefits, and consumer preference for eco-friendly products, herbal cosmetics are becoming more and more popular. The creation and assessment of a polyherbal cream using extracts from cucumber peel, Amla, and Aloe Vera—all of which are well-known for their positive benefits on skin health—is the main goal of this study. Aloe Vera is used to cure sunburns, acne, and indications of aging because of its calming and anti-inflammatory qualities. Cucumber peel offers cooling, moisturizing, and anti-inflammatory properties, while amla, which is high in vitamin C and antioxidants, is useful for treating acne, anti-aging, and skin lightening. A two-phase technique was used to develop the cream, combining aqueous and oil phases to produce a semisolid emulsion. Physical characteristics such as color, consistency, pH, Spreadability, washability, and non-irritancy were used to assess the created cream. The cream had a smooth consistency, a PH of 6.8, and good Spreadability and Washability, according to the results. Since there was no skin sensitivity, the product is safe and suitable for topical application. The study shows how extracts from cucumber peels, Amla, and Aloe Vera can create an herbal cream that has both medicinal and cosmetic benefits.

2. DR ASHUTASHKUMARYADAV, SUMIT SINGH, AKASHVERMA et.al., (2024)

Objective: The goal is to create and assess a multipurpose herbal cream with aloevera gel, neem extract (Azadirachta indica), and turmeric (Curcuma longa). Methods: Liquid paraffin, beeswax, methyl paraben, borax, distilled water, aloe vera gel, and extracts of neem and turmeric were used to make the cream base. Theslab technique or extemporaneous approach was used to produce the cream in order to adequately mix all of the ingredients and give it a smooth texture through geometric mixing. We created batch F1H of our herbal cream utilizing the slab technique. A variety of factors, including physical evaluation, pH, irritancy, viscosity, phase separation, and Spreadability, were tested and analyzed for the F1H batch. Results: The F1H formulations showed good appearance, a nearly neutral pH, no skin redness, erythema, or edema, easy washing, good spread ability, and no phase separation during the irritancy assay. The F1H formulations were demonstrated to be stable at room temperature. **Conclusion:** The cream's multipurpose effect was demonstrated by the use of aloe vera gel, neem, and turmeric, and each of the herbal constituents demonstrated distinct, noteworthy activity. We can conclude from the results that formulations F1H are safe to apply to the skin and were stable at room temperature. Keywords: Curcuma long-a (turmeric), Azadirachta indica (neem), and Aloe Barbadensis (gel).

3. MUGGUSANKARABHAVANI, CH. NAVEENA, P. NAGAMANIet.al. (2023).

The goal of the current study was to create an herbal face cream that would improve the skin's emollient properties, moisture content, and nourishment. Aloe Vera gel and Crocus sativa aqueous extract, which are frequently used as emollients and skin nourishes, were used in the formulation of this herbal face cream. The primary difficulty is choosing natural materials that are comparable to manufactured materials and can be rationally justified. The goal of the current study is to create a natural herbal face cream. Trituration was used to make the herbal face cream, which was then assessed for a number of assessment parameters, including physical characteristics, pH determination, Spreadability, viscosity, washability, after-feel test, greasiness, phase separation, irritability test, and stability test. The herbal face creams have a semi-solid form, smooth consistency, a nice odor, and a subtle yellow color. The F3's pH was discovered to be 5.1. The F3 was found to have a viscosity of 24389 Cps and a Spreadability of 15. 16g.cm/s. The F3 was readily washable with tap water and showed no signs of phase separation. The F3's feel test revealed that it was in good condition, showing no signs of separation, greasiness, or discomfort.

4. VATIKACHAUHAN, NIPUNVAID MEHTA et.al., (2022)

Aloe vera juice is found in the plant aloe vera. Medicinal plants that have been used for thousands of years in a variety of herbal medicines, such as homeopathy, Siddha, and Ayurveda. The mucilaginous tissue found in the center of an aloe vera leaf is used to make aloe vera gel, a cosmetic and therapeutic product. Aloe vera gel does not contain antraquinone. Which are in charge of aloes' potent laxative qualities? In entire leaf extract, antraquinone may be found. Aloe vera has 75 potentially active components, including vitamins, enzymes, minerals, carbohydrates, saponins, and amino acids. Face cream is a preparation that is semi-solid. They are frequently used to moisturize and enhance skin tone. This research project's primary goal is to make a herbal cream and assess its effectiveness. Numerous aspects of the formulation are assessed, including its pH, homogeneity, consistency, stability, appearance, and organoleptic qualities. The formulation produced a satisfactory outcome.

5. GANTAMANASA, DR.T. SATYANARAYANA, MD.KAMAL PASHA et.al., (2021)

A significant portion of the Indian population still uses the traditional, primarily plant based medical system. Nowadays, the development of herbal and Ayurvedic preparations is progressing because of the broad applications of plant materials. Pharmaceutical creams are semi-solid preparations, and the use of medicinal plant ingredients in pharmaceutical dosage forms is becoming increasingly significant. The goal of the current study was to create and assess creams using natural components that contain therapeutic compounds meant for external application. For formulation, leaves from Azadirachta indica, Syzygium samarangese, Carica papaya, Annona reticulate, and Curcuma longa were chosen. To create a distinct formulation, the plant ingredients were first extracted using ethanol, and then dried extracts were added in varying amounts. Physical characteristics of the formulated cream, such as its pH, viscosity, and Spreadability, were assessed. The antibacterial and antifungal properties of the polyherbal cream were tested using microorganisms throughout the 45 day stability trials, which were spaced 15 days apart.

6. DR.S. VALARMATHI, DR.M. SENTHIL KUMAR, VIGNESHSHARMA et.al. (2020).

Face creams are semi-solid preparations intended to enhance facial appearance. Preparing face creams with various herbs and assessing their effectiveness is the primary goal of this research project. The dried aloe vera powder, dried hibiscus flower powder, dried senna articulate powder, dried coriander powder, and dried poly herb powder are the herbs utilized in the preparations (F1, F2, F3, F4, and F5). Numerous characteristics, including organoleptic qualities, pH, stability, homogeneity, consistency, and appearance, are assessed for the face cream formulations. The findings demonstrated that every formulation had positive outcomes. The single-herb formulations F1, F2, F3, and F4 are contrasted with the polyherb formulation F5.

7. ARCHANA DHYANI, VIKAS CHANDER, et.al., (2019).

The products used to enhance person's look are known as herbal cosmetics. The current study's goal was to create an herbal cream that could be used to nourish, moisturize, and treat a variety of skin conditions. The cream is made with a variety of crude medications, such as Emblica Officinali (Amla), Curcuma longa (turmeric rhizomes), Azadirachta Indica (neem leaves), and Aloe barbadensis (aloe Vera leaves). The choice of components according to the various therapeutic qualities of the substances. A number of evaluation criteria are applied to the cream.

8. M.O. ILOMUANYA, T. AJAYI, I. CARDOSO-DAODU et.al., (2018)

Background: Aging is a normal, progressive process that causes changes in the skin's appearance and functionality. The purpose of this study is to create and assess a polyherbal antioxidant face cream with ethanol extracts of ocimum gratissimum and Psidium guajava. Method: Six distinct emulsion bases were mixed with different amounts of the plants' ethanol extract. The formulations' antioxidant activity was evaluated by means of the 2, 2-Diphenyl-1-picrylhydrazyl technique. The formulations were examined for pH, viscosity, Spreadability and microbiological content. All of the formulations underwent accelerated stability tests to evaluate their stability under various storage circumstances. Results: All of the formulations demonstrated good homogeneity, appearance, consistency, spread ability, and pH without experiencing phase separation. All formulations displayed non-Newtonian pseudo plastic flow, according to rheological experiments. Additionally, concentration-dependent antioxidant activity was demonstrated by all six formulations. These tests used ascorbic acid, a strong antioxidant, as the standard. With an IC50 value of 80.1 µg/mL, formulation AFCR6 exhibited the highest level of antioxidant activity. Conclusion: It has been demonstrated that the polyherbal antioxidant cream with Psidium guajava and Ocimum gratissimum extracts have superior antioxidant qualities. It can help prevent photo aging by shielding the skin from reactive oxygen species produced by UV rays and environmental pollutants.

9. OLIVIER TENE TCHEGHEBE, ARMEL JACKSONSEUKEP et.al., (2017)

Herbs and plants have been used as food and medicine for thousands of years. Numerous studies have documented that indigenous people from tropical countries use various parts of Sida acuta to treat a variety of illnesses, including rheumatic affections, azoospermia, oligospermia and spermatorrhea, leucorrhoea, wounds, sciatica, diseases of the nervous system and heart, colds, coughs, asthma, tuberculosis, and respiratory conditions, disorders of the blood, bile, and liver, elephantiasis, hemorrhoids, ulcers, gastric disorders, abdominal pain, headache, fever and malaria, skin diseases, worms, diarrhea and dysentery, venereal diseases, renal inflammation, toothaches, and snake bites. Numerous pharmacological characteristics of Sida acuta, including antioxidant, antimicrobial and antibacterial, antimalarial, cardiovascular, antiulcer, analgesic and anti-inflammatory, antipyretic, hepatoprotective, hypoglycemic, insecticidal, and anticancer, have been the subject of scientific investigation. Furthermore, it has been demonstrated that rats given this plant extract up to a dosage level of 2000 mg/kg body weight did not die. The plant extract's numerous qualities and applications in traditional medicine are explained by bioactive components that are prominently found in it, including alkaloids, saponins, coumarin, steroids, tannins, phenolic compounds, cardiac glycosides, sesquiterpene, and flavonoids. This review study aims to provide a thorough analysis of the literature on Sida acuta's toxicity, phytochemical and pharmacological profiles, and ethnomedicinal usage.

10. PRIYAR. KAWARKHE, SUBHASHV. DESHMANE. et.al., (2016)

Antioxidants prevent cellular damage by neutralizing free radicals, unstable oxygen molecules that degrade skin cells and result in wrinkles. Antioxidants from natural sources were used to create face cream formulations in this experiment. Grape seed extract and raspberry extract were used. Using the DPPH technique and standard ascorbic acid, the radical scavenging activity of raspberry and grape seeds was investigated. Two formulations, BF1 and BF4, were optimized out of six cream base formulations that were developed. Using 2% extract, six antioxidant cream compositions were created. Numerous evaluation tests were conducted, including those for pH, viscosity, grittiness, Spreadability, skin irritation, and antibacterial properties. A one-week stability investigation was also carried out. The IC50 values for grape and raspberry seeds were 0.072 and 0.033 µg/ml, respectively, indicating extremely strong antioxidant activity. All face cream formulations have good preservation action, as seen by the active zone of inhibition, which is within the 9–12 mm range. According to the study's findings, natural sources of excipient are better because they are readily available, non-toxic, and biocompatible. It is determined that the product has the best ability to minimize free radicals and may be used as a barrier to protect skin after examining the stability study evaluation and physical parameters.

3. AIM

The aim of research was to formulate and evaluate the Herbal face cream using plant extract of sida acuta that may have the major use full parameters.

OBJECTIVES

This study evaluates the phytochemical; pre formulation and post formulation screening of plant extract sida acuta Sida acuta have the anti acne, anti inflammatory, anti bacterial, and anti oxidant property.

4. PLAN OF WORK

Collection and authentication of plant

↓

Drying of plant under shade and then grind to make a powder

↓

Extraction of plant material by using soxhlet apparatus

↓

Phytochemical evaluation of sida acuta

↓

Evaluation of pre formulation and post formulation

↓

Anti bacterial, Anti oxidant, Anti acne, Anti Inflammatory property

↓

Result and discussion

↓

Conclusion

4.1 PLANT PROFILE

4.2 SYNONYMS

Sida Acuta is also known by various synonyms such as

- ✓ Sida carfinifolia L.F
- ✓ Sida stipulates Cav
- ✓ Sida glabra mill
- ✓ Sida acuta var.carpinifolia [L.F] K. schum

Sida acuta var. glabra [Mill] K.schum

4.3 TAXONOMICAL CLASSIFICATION

Taxonomical classification of Sida acuta plant such as.

Table: 1

Kingdom	Plantae
Clade	Trancheophytes
Clade	Angiosperm
Clade	Eudicots
Clade	Rosids
Order	Malvales
Family	Malvaceae
Genes	Sida
Species	S. Acuta
Binomial Name	Sida Acuta

4.4 COMMON NAMES

Different vernacular names of Sida Acuta have been reported in table.

Table; 2 Common names.

LANGUAGES	COMMON NAMES
English	broom weed
Hindi	Karate, kharenti
Malayalam	Malatanni
Marathi	Chikana
Sanskrit	Bala
Tamil	Malaidangi , Arivaal Mooku Pachilai
Telugu	Nelabenda
Kanada	Vishakaddi

4.5 ORIGIN AND DISTRIBUTION

- ➢ Believed to originate from Central America; it's thought to have roots in this tropical region.
- ➢ Now it's widely distributed throught out tropical and sub tropical regions of the world.
- ➢ Found in Asia, Africa, Australia and the pacific island as a naturalized weed
- ➢ In India it grows commonly along roadside, waste places, cultivated field, and open lands.

4.6 ECOLOGY

Sida acuta is a widespread, ruderal plant that thrives in disturbed, tropical and sub tropical habitats like roadsides, waste places, and pastures, proffering dry, sandy conditions but also growing in heavy clay soils.

4.7 PROPAGATION

Sida acuta can be propagated but both seeds and stem cuttings. For seed propagation, sow seeds in a well – drying mix during the growing season and keep them moist. For cuttings, take a healthy stem cutting and plant it in moist soil. Tissue culture can also be used for

propagation, with certain hormone combinations showing effectiveness in stimulating shoot growth.

4.8 TRADITIONAL USES

Sida acuta plant that has been traditionally used in the treatment of many diseases it includes such as,

- Treating fevers
- Malaria
- Head aches
- Coughs
- Diahorrea
- Toothaches
- Respiratory infections
- Nervous and urinary disorders
- Asthma

4.9 MORPHOLOGICAL CHARACTERS

Sida acuta is an erect, branching, undershrub, with a fibrous, hairy stem and a tough taproot.

4.9.1 LEAVES

Alternate, simple, lanceolate, to linear, rarely ovate to along, obtuse at the base, acute at the apex, coarsely and remotely serrate; petiole much shorter than the blade; stipulate, stipules free – lateral, unequally paired at the node, reticulate venation.

4.9.2 FLOWER

Small, axillary 2-3 in a cluster; pedicels jointed at the middle, epicalyx absent, Complete, by sexual, regular, actinomorphic, hippogynus, pentamarus, yellow.

4.9.3 FRUIT

A Schizocrapic mericarp, seed 1 in each mericarp.

4.9.4 STEM

The stem of Sida acuta is slightly woody, cylindrical, and can be covered in sparse or dense star-shaped [steelate] hairs. It's fibrous and is used in traditional medicine for making brooms.

4.9.5 ROOT

The root of Sida acuta plant, also known as broom weed, has numerous ethnomedicinal uses, with its juice and extracts showing potential for treating toothache, fever, [febrifuge], skin ointment, and even having anti-inflammatory, anti-bacterial and anti-plasmodial properties.

4.10 QUALITATIVE PHYTO CHEMICAL SCREENING

Alkaloids, tannins, flavonoids, phenols, steroid, carbohydrates, cardiac glycosides, phlobapannins, fixed oil and fats were screened on the leaf extract.

4.11 NUTRITIONAL COMPOSITION

Sida Acuta [wire weed] is nutritionally rich, with high level of protein [around 18%], carbohydrates [around 66%] and crude fiber [around 5-6%]. It also contains significant amounts of minerals like magnesium, potassium, and calcium, as well as vitamins such as thiamine, riboflavin, and ascorbic acid [vitamin C]. The plant is also a source of various phytochemical, including flavonoids, alkaloids and saponins, which have medicinal properties.

Table -3: Nutritional composition of Plant.

CONSTITUENTS	QUANTITY OF PLANT
WATER	Q. S
PROTEIN	17.85% to 18.01%
FIBRE	17.85% to 18.01%
CARBOHYDRATE	66.21%
FAT	-
CALCIUM	44.32 to 127.6
PHOSPHORUS	78.6 or 1.15
ASH	-
IRON	1.01 to 2.14
SODIUM	81.90
VITAMIN A	-
VITAMIN C	24.27 to 30.17
CALORIES	Approximately 360.54 Kcal/100g
RIBOFLAVIN	0.05 to 0.12
NIACIN	0.14 or 0.19
POTASSIUM	31.6 to 117.40
THIAMINE	0.33 to 0.36

5. MATERIALS AND METHODS

5.1 MATERIALS

- Sida acuta extract
- Aloe vera gel
- Bees wax
- Liquid paraffin
- Borax
- Methyl paraben
- Rose oil
- Benedicts reagent
- Million's reagent
- Sodium bicarbonate
- Ferrous sulphate
- Sulfuric acid

5.2 INSTRUMENT

- Soxhlet apparatus
- Digital pH
- Water bath

5.3 PLANT MATERIAL

In these present studies, Sida acuta was selected because it is considered anti acne, anti oxididant, anti inflammatory, anti bacterial.

5.4 COLLECTION OF PLANT MATERIAL

The fresh Sida acute whole plant was collected from Tirupattur, Tamil Nadu.

6. PREPARATION OF EXTRACT

6.1 PREPARATION OF SIDA ACUTA

6.1.1 Cleaning and drying

Thoroughly clean the plant material collected to remove any dirt or debris. Allow it to air dry in a shaded area to prevent degradation of active compounds alternatively, you can use a food dehydrator or an oven set to a low temperature for drying.

6.1.2 Grinding or crushing

Once grind, grind the plant material into a coarse powder using a mortar and pestle or an electric grinder. Ensure that the powder is uniform in texture to facilitate extraction.

Figure: 02.

6.1.3 Extraction

There are various methods for extracting bioactive compounds from plant material.

6.2 Common extraction method includes

6.2.1 Ethanol extraction

The solid powdered plant material is placed in the sox thimble, the ethanolic solvent was used for this extraction. The 70% ethanolic solvent was placed in the round bottom flask and the solvent is heated under the reflex by using heating mantle under the control temperature. Seal the container and let it soak for a specified period, with occasional shaking or stirring after extraction, filter the mixture to remove solid particles, and then evaporate the ethanol under reduced pressure using a rotary evaporator or by air-drying to obtain the crude extract.

6.2.2 Concentration and drying

Once the extraction is complete, concentrate on the extract using a rotary evaporator or by air-drying. The resulting concentrated extract was stored there in a cool, dry place for further use.

6.2.3 Quality control

Performed appropriate quality control tests to assess the phytochemical composition, purity and potency of the extract. This includes assays for specific bioactive compounds, such as flavonoids, alkaloids, or phenolic compounds, as well as tests for contaminants.

Figure: 03

6.2.4 Standardization

Standardizes the extract to ensure consistency in this composition and therapeutic effects. They involved adjusting the extraction parameters or adding standardized markers for quantification. It is important to note that the specific extraction method and conditions vary depending on the desired phytochemical and intended use of the extract. Additionally, I ensured compliance with ethical and legal guidelines regarding the collection and use of plant materials.

6.3 YIELD AND COLOR DETERMINATION

The color of the extract was observed visually. The yield of the extract was calculated using the following formula.

%yield= (weight of the extract\ weight of powder taken) +100

6.4 PREPARATION OF ALOE VERA GEL

Mature, healthy and fresh aloe vera leaves were collected and washed with distilled water. Then after proper drying of leaves in hot air oven, the outer part of the leaves was dissected longitudinally using a sterile knife. Then the aloe vera gel that is colorless parenchymatous tissue was removed using the sterile knife. Then it is filtered using muslin cloth to remove the fibers and impurities. Then the filtrate or the filter product which is clear aloe Vera gel used in the preparation.

6.5 PREPARATION OF HERBAL FACE CREAM

- Heat liquid paraffin and bees wax in a borosilicate glass beaker at 75^{o} C and maintain that heating temperature. (Oil phase)

- In another beaker, dissolve borax, methylparaben undistilled water and heat this beaker to 75°C to dissolve borax and methylparaben and to get a clear solution (aqueous phase).
- Then slowly add this aqueous phase to heated oily phase.
- Then add a measured amount of aloe vera gel, sida acuta extract and stir vigorously until it forms a smooth cream.
- Then add few drops of rose oil as a fragrance.
- Put this cream on a slab and add few drops of distilled water if necessary and mix the cream in a geometric manner on the slab to give a smooth texture to the cream and to mix all the ingredients properly.
- This method is called as slab technique or extemporaneous method of preparation of cream.

6.5 COMPOSITION OF HERBAL FACE CREAM

S.NO	INGREDIENTS	F1H	F2H	F3H	USES
1.	Sida acuta	Q. S	Q. S	Q. S	Anti microbial, wound healing
2.	Aloe vera gel	1.5ml	1ml	1ml	Anti-ageing, anti-inflammatory, moisturizer, Reduce acne and pimples
3.	Bees wax	3g	3.5g	3.2g	Emulsifying agent, stabilizer and use thickness to the cream
4.	Liquid paraffin	10ml	15ml	12ml	Lubricating agent
5.	Borax	0.2g	0.4g	0.3g	Alkaline agent which reacts with emulsifying agent to form soap
6.	Methyl paraben	0.02g	0.04g	0.03g	Preservative
7.	Distilled water	Q. S	Q. S	Q. S	
8.	Rose oil	Q.S	Q. S	Q. S	Fragrance

Figure:04.

6.6 PREFORMULATION STUDY OF RAW MATERIALS

1) PHYTOCHEMICAL SCREENING OF CONSTITUENTS

TEST	PROCEDURE	OBSERVATION
Carbohydrates	**BENEDICT'S TEST:** little amount of filtrate +Benedict's reagent [5ml] heated on water bath for few minutes.	Appearance of red orange ppt indicates presence of carbohydrates
Proteins	**MILLIONS TEST :** To 2ml of filtrate few drops of millions reagent are added. the result was observed	A White ppt indicates presence of proteins
Vitamins	**TEST FOR VITAMINS:** To 2ml of 2% w\v solution add 2ml of water. 1gm of sodium bicarbonate and about 20mg of ferrous sulphate, shake and allow to stand a deep violate colour is produced add 5ml of sulphuric acid.	The colour disappears indicates positive test
Alkaloids	**MAYER'S TEST:** To 1ml of filtrate, few drops of Mayer's reagent is added by side of the test tube.	The white or creamy precipitate. It indicates test as positive
Phenolic compounds	**LEAD ACETATE** SOLUTION: To 2-3 ml of aqueous extract add few drops of lead acetate solution.	A white ppt indicates presence of phenolic compounds
Tannins	**FERRIC CHLORIDE:** Test solution+5%ferric chloride solution (few drops)	Blue-black/ green black colour indicates presence of tannins
Flavonoids	**ALKALINE REAGENT** TEST: Test solution+NaOH (few drops)	Deep yellow colour indicates presence of flavonoids

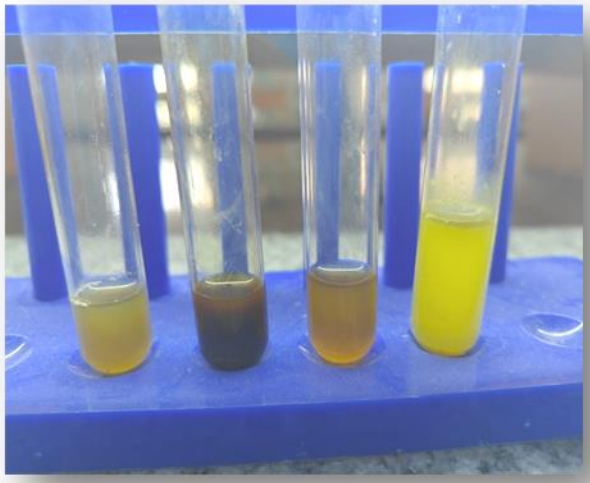

Figure: 05.

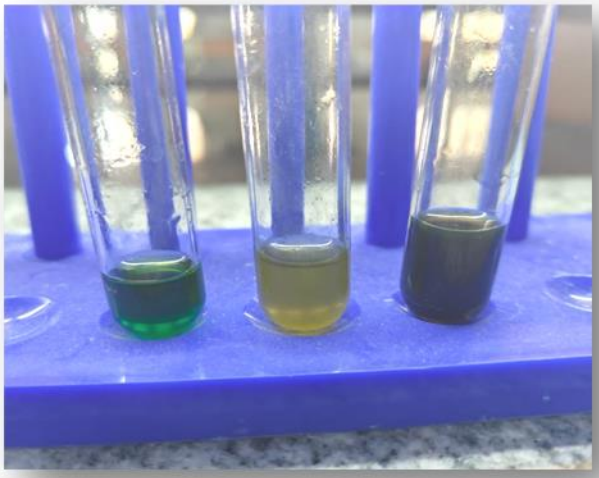

Figure:06.

2) DETERMINATION OF TOTAL ASH

Useful for detecting low grade products useful for detecting exhausted products, useful for detecting excess of sandy useful for detecting earthy matter with drug. Weigh accurately about 2-3 gm of the powdered drug in a tard silicas crucible. Incinerate the powdered drug by gradually increasing the temperature $55^{O}C$ until free from carbon and cool keep it in desiccators. Weigh the ash and calculate the % of ash with reference to the air-dried sample.

Formula

$$\%\text{Total ash} = \frac{\text{Ash weight}}{\text{Weight of sample}}$$

3) WATER SOLUBLE TEST

To the crucible containing the total ash, add 25ml of water and boil for minutes. Collect the insoluble matter in a silica crucible or on the ash less filter paper wash with hot water ignites in a crucible for 15 minutes at a temperature not exceeding 450 C. Subtract the weight of this residue in mg from the weight of total ash. Calculate the content of water –soluble ash in mg per g of air-dried material.

Formula

$$\%\text{Water soluble ash} = \frac{\text{Total ash weight- water insoluble residue in total ash}}{\text{Weight of sample}}$$

4) SOLUBILITY TEST

Adding solute for solubility analysis is small incremental amount to fix the volume of solvents such as ethanol, acetone and chloroform. After undissolved particles will be examined**.**

5) UV SPECTROSCOPY METHOD

Calibration curve of Sida acuta extract was prepared in distilled water at maximum wavelength of 281 nm. Distilled water was used for the preparation of calibration curve. 1ml of crude extract was dissolved in 100 ml of distilled water that is treated as stock solution. This stock solution was diluted to get different concentrations. Final solution was scanned for lambda maximum in the range of 200-400 nm using UV spectrometers.

6) THIN LAYER CHROMATOGRAPHY

Prepare the slurry (5gm of silica gel G in 12.5ml of water) then slurry spreader in TLC plate. Then coated plate was placed in air for 30mins and then in hot air oven at 100^{o} C for 30minutes. Mobile phase (ethanol) suitable solvent poured in the TLC chamber and closed the chamber leave it for some time. Then place TLC plate on the TLC chamber after solvent front gets to top of the plate then remove TLC plate and position of solvent as marked, then plate placed in hot air oven at 100^{o} C for 30minutes. Then dilute sample solution should apply on TLC plate by using capillary tube and place TLC plate, when sample spot was obtained then remove TLC plate. Then measure the distance travelled solvent and the distance travelled by the spot. Calculate the RF value.

Formula

$$\text{Rf value} = \frac{\text{Distance travelled by component}}{\text{Distance travelled by solvent}}$$

6.7 EVALUATION PARAMETERS OF FORMULATION

6.7.1 Color examination

- 5ml of prepared face cream was taken on a watch glass.
- Colour was observed by naked eye.

6.7.2 Odor examination

- 2ml of prepared face cream was taken and smelled.
- Then odour was observed.

6.7.3 PH examination

- Wash the electrode with distilled water and cleaned.
- Place the electrode in pH 7 buffer solution and set the value of 7 on the pH meter turning the calibrate knob on the meter.
- Removed the electrode and washed with distilled water and cleaned.
- Then placed electrode in the pH 4 buffer solution. Adjust the value.
- Then electrode was placed in the final face cream and pH was observed.

6.7.4 Wash ability

Formulations were applied on the skin & then ease & extent of washing with water were checked manually.

6.7.5 Spread ability

Spread ability denotes the extent of area to which the gel readily spread on application to skin or the affected part. The bioavailability efficiency of a gel formulation also depends on its spreading value.

6.7.6 Phase separation

Prepared cream was kept in a closed container at a temperature of 25-100^{o}C away from light. Then phase separation was checked for 24 hours for 30 days. Any change in the phase separation was observed / checked.

6.7.7 Irritancy test

Mark an area (1 sq.cm) on the left-hand dorsal surface. Definite quantities of prepared face pack were applied to the specified area and time was noted. Irritancy, erythematic, edema was checked if any for regular intervals of time.

6.7.8 Stability studies

Stability testing of prepared formulation was conducted by storing at different temperature conditions for the period of 72 hours. The packed glass vials of formulation stored at different temperatures were evaluated for physical parameters like colour, odour, pH, consistency and feel.

7. RESULT AND DISCUSSION

7.1 RESULTS

Phytochemical evaluation

Table 04: Phytochemical test for sida acuta.

PHYTOCHEMICALS	STATUS
Carbohydrates	+
Proteins	+
Vitamins	+
Alkaloids	+
Phenolic compounds	+
Tannins	-
Flavonoids	+

+ = Present of phytochemical

- = absence of phytochemical

7.2 CONCLUSION

The present study on the formulation and evaluation of a herbal face preparation containing ethanolic extract of Sida acuta demonstrates that plant-based cosmetics can serve as effective and safer alternatives to synthetic products. The ethanolic extraction method was found to efficiently isolate the bioactive constituents responsible for antimicrobial, antioxidant, and skin-protective properties.

The formulated herbal face product showed satisfactory physicochemical characteristics such as appropriate pH, good Spreadability, stability, and homogeneity, indicating its suitability for topical application. Evaluation studies confirmed that the formulation is non-irritant, stable under different conditions, and possesses beneficial effects on skin health.

The presence of phytoconstituents in Sida acuta contributes to its potential in treating common skin problems like acne, inflammation, and microbial infections. Overall, the study supports the use of Sida acuta extract in herbal cosmetic formulations and highlights its promising role in the development of natural skincare products.

Further studies, including clinical evaluation and long-term stability testing, are recommended to establish its efficacy and safety on a larger scale.

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