JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Review on: "Formulation, Development and Evaluation Of Herbal Anti-ageing and Anti-wrinkled Cream"

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ABSTRACT

In the course of this research project, we focused on the development of creams harnessing the potent anti-ageing and anti-wrinkle properties inherent in herbal extracts, meticulously evaluating their efficacy. Central to our formulation was the utilization of Ocimum tenuiflorum as a key active ingredient, infusing the creams with notable antibacterial attributes. Employing the oil-inwater emulsion method, we carefully curated a composition featuring Aloevera gel, stearic acid, honey, glycerin, olive oil, and rose oil.

To gauge the stability of the formulated cream, a rigorous testing process was implemented under accelerated conditions at 40°C ± 2°C. Our comprehensive findings underscore the potential of these herbal creams as a reliable and protective skin barrier. Notably free from adverse side effects and enriched with antibacterial properties, our research suggests that these formulations have the capacity to effectively combat signs of aging, offering a holistic approach to skincare.

INTRODUCTION

The skin, the body's largest organ, comprises water, protein, fats, and minerals, serving as a protective barrier against microbes and regulating internal temperature. Nerves in the skin enable the perception of sensations such as hot and cold. Together with hair, nails, oil glands, and sweat glands, the skin forms the integumentary system, the body's outer covering. The integumentary system consists of three layers: the epidermis (top layer), dermis (middle layer), and hypodermis (bottom or fatty layer).

The epidermis, visible and touchable, is composed of skin cells containing keratin, a protein that, along with others, binds to create this layer. The epidermis acts as a protective barrier, generates new skin, and safeguards the body. The dermis, constituting 90% of the skin's thickness, contains collagen and elastin, promotes hair growth, facilitates sensory perception, produces sweat, and supplies blood. The hypodermis, the fatty layer,

cushions muscles and bones, contains connective tissue, supports nerves and blood vessels, and regulates internal temperature.

Maintaining a healthy and functional skin barrier is crucial for protection against dehydration, penetration of microorganisms, allergens, irritants, reactive oxygen species, and radiation. The skin barrier can be adapted to allow specific penetration, and regular skincare routines enhance skin regeneration, elasticity, and smoothness, temporarily influencing the skin's condition.

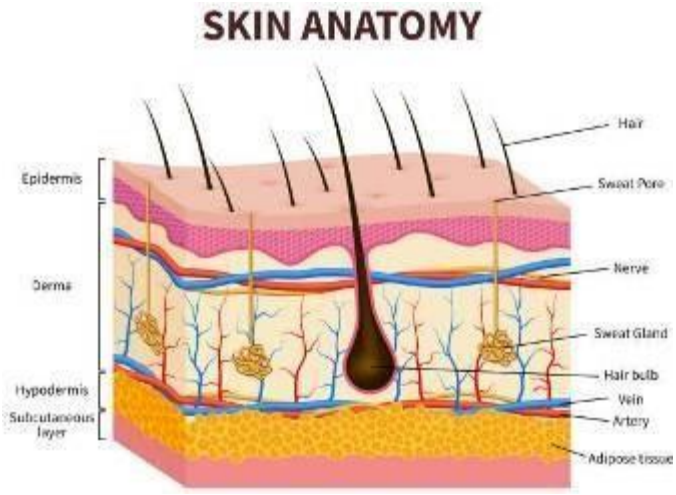

Fig no-1- SKIN ANATOMY [11]

The dermis exhibits a three-layer structure comprising the papillary layer, subpapillary layer, and reticular layer. These layers collectively provide strength and elasticity to the skin. The dermis is composed of interstitial components, including fibrous tissues forming the extracellular matrix, and its productive cells. The extracellular matrix consists mainly of collagen fibers, specifically type I and type III collagen, elastic fibers, and proteoglycans such as hyaluronan and chondroitin sulfate.

Collagen, comprising 70% of the dry weight of the dermis, imparts firmness to the skin. Elastic fibers, arranged in a cross-linked structure, contribute 2% of the skin's elasticity. Moisture content is regulated by proteoglycans, forming a gel that aids in retaining water for skin moisture. Within the dermis, sensory nerve endings sense feelings, comfort, and temperature.

Additionally, the dermis houses hair follicles, secretory glands (sweat and sebaceous glands), blood vessels for temperature regulation, and subcutaneous tissues, a fatty layer providing cushioning and shock absorption. The thickness of this fatty layer varies across different body parts. Adipose tissue within the subcutaneous layer functions as energy storage.

The butterfly pea (Clitoria ternatea L.), a member of the Fabaceae family, is abundant in tropical regions, including Southeast Asia. In Ayurvedic medicine, it is recognized for its medicinal properties, particularly in enhancing mental abilities. The plant contains beneficial compounds such as polyacylated anthocyanins and flavonol glycosides known as ternatins. These compounds exhibit antioxidant, antidiabetic, antiobesity, anti-inflammatory, anticancer, antihyperlipidemic, and antiasthmatic properties.

The blue color of butterfly pea flowers results from anthocyanins, which are soluble in water. These flowers, rich in flavonoids, serve as natural antioxidants, preventing skin aging and promoting skin health. The anthocyanins in Clitoria ternatea have various health benefits, making it a valuable component in traditional medicine and a natural coloring source for dishes.

PHARMACOGNOCY:-

SYNONYMS: Clitoria albiflora Mattei, Clitoria bracteata Poir. Clitoria mearnsii De Wild., Clitoria tanganicensis Micheli, Clitoria zanzibarensis Vatke.

BIOLOGICAL SOURCE:- It consist of dried seeds of plant perennial herbaceous belonging into family fabaceae.

FAMILY: Fabaceae.

GENUS: Clitoria L.

SPECIES: Clitoria ternatea.

TRADITIONAL USES:-

The root was employed in the treatment of ascetics, abdominal viscera enlargement, sore throat, and skin diseases. While it served as a purgative, its usage was discouraged due to the potential for causing griping and tenderness. Administered with honey and ghee, the root functioned as a general tonic for children, enhancing mental faculties, muscular strength, and complexion. Additionally, the roots found application in addressing epilepsy and insanity. Seeds and leaves were commonly utilized as a brain tonic, contributing to the improvement of memory and intelligence. The juice and flowers served as an antidote for snake bites, while seeds were employed for swollen joints, and crushed seeds were ingested with cold or boiled water to alleviate urinary problems.

CHEMICAL CONSTITUENTS:-

Taraxerol and taraxerone, pentacyclic triterpenoids, along with flavonol glycoside (3,5,4′trihydroxy-7-methoxyflavonol-3-O-β-d-xylopyranosyl-(1,3)-O-β-d-galactopyranosyl-(1,6)-O-β-dglucopyranoside), are found in the root of CT. In addition to protein and fatty acid content, CT seeds also encompass p-hydroxycinnamic acid, β-sitosterol, γ-sitosterol, adenosine, flavonol-3glycoside, ethyl-α-d-galactopyranoside, 3,5,7,4′-tetrahydroxyflavone, 3-rhamnoglucoside, hexacosanol, and an anthoxanthin glucoside. Kelemu et al. documented the presence of the antimicrobial and insecticidal protein finotin in the seeds of CT. The flowers of CT contain ternatins A1-3, B1-4, C1-5, D1-3. Additionally, the flowers house kaempferol, kaempferol 3neohesperidoside, and kaempferol 3-2G-rhamnosylrutinoside, while kaempferol 3-rutinoside is also identified. Various plant parts, including leaves, seeds, bark, fruits, sprouts, and stems, have been traditionally used for medicinal purposes.

MORPHOLOGY CHARACTERISTICS:-

The pea flowers measure approximately 4 cm in length and 3 cm in width, featuring 5 petals, 2 wings, 2 keels, and a vibrant yellow banner at the center. The pea plant is a climbing legume with delicate leaves ranging from 2.5 to 5 cm in length and 1.5 to 3.5 cm in width. As an evergreen plant, it boasts a fibrous root system, and its substantial nodules can effectively fix nitrogen with the aid of Rhizobia bacteria. Clitoria ternatea, a perennial plant, reproduces through black seeds, and its pods reach a length of about 7-11 cm. Widely utilized in the food industry, the root and leaves of this plant find application in medicinal and herbal beverages. Notably, butterfly pea powder, derived from the blue pea flowers, stands out as a globally popular product in various markets.[1]

HERBAL COSMETICS

Herbal cosmetics, also referred to as natural or Ayurvedic cosmetics, trace their origins back to the dawn of civilization when individuals sought to enhance their appearance. During this period, there were no sophisticated fairness creams or cosmetic surgeries available. Instead, people relied on the ancient wisdom of Ayurveda, utilizing the knowledge of nature. Ayurvedic cosmetics, crafted from various herbs and botanicals, proved to be effective in beautifying the skin. Beyond enhancing aesthetics, these Ayurvedic formulations acted as a protective shield, safeguarding the body against external influences.

ANTI AGING Spices boast a wealth of nutrients, serving as anti-aging, rejuvenating, and revitalizing agents. Varieties such as carrot and ginkgo are particularly rich in phytochemical compounds, acknowledged for their antioxidant properties. Aloe Vera, a herbal plant belonging to the Liliaceae family, is exclusively found in cultivation, devoid of naturally occurring populations. However, closely related aloes do exist in northern Africa. Aloe Vera contains essential amino acids like leucine, isoleucine, saponin glycosides providing cleansing action, along with vitamins A, C, E, B, choline, B12, foliate, and exhibiting inhibitory activity.

Aging is an inevitable process for all living organisms, beginning from birth and becoming notably apparent on the skin in later years. With an anticipated increase in the global older adult population (60 years and above) to over 1.2 billion by 2025, addressing the aging process becomes a critical public and clinical concern. Aging is associated with factors such as increased vulnerability, immune senescence, and potentially mitochondrial dysfunction. Preserving physical function in older adults is therefore paramount.

The skin, as the most visibly impacted tissue in humans, acts as a protective barrier against the external environment. It regulates temperature, fluid balance, and guards against harmful organisms and UV radiation from the sun. There are two types of skin aging: agedependent/chronological aging and premature aging/photoaging. Photoaging results from external factors and manifests as a rough appearance, dark/light pigmentation, and deep wrinkles. Natural aging is characterized by skin wrinkling. The skin comprises three layers: the epidermis, dermis, and subcutaneous tissueIt also engages in the trade of supplements and derivatives while actively participating in rapid tissue expansion, regeneration, and repair. As individuals age, the levels of collagen, elastin, and hyaluronic acid decline, resulting in a loss of strength and flexibility in the skin. This leads to noticeable wrinkles associated with a thickened epidermis, mottled discoloration, laxity, dullness, and roughness of the skin. Modern science and technology offer non-invasive procedures such as plastic surgery, laser rejuvenation, and more, with 1591 effects compared to invasive methods that are more painful and demanding.

Over the past decade, there has been a surge in the use of herbal extracts in cosmetics to mitigate the aging process. Extracts from Aloe Vera, Amla, Turmeric, Cucumber, Ginseng, Honey, Wheat, Liquorice, Arjuna, and Jatamansi are widely employed in the herbal cosmetic industry due to their skin-beneficial properties.

The extracellular matrix (ECM), the outermost part of the skin consisting of fibroblasts and proteins like collagen and elastin, plays a crucial role. After the age of 20, signs of degradation become apparent as collagen content per unit area starts decreasing—approximately a 1% reduction per unit area of the skin annually. The ECM provides a foundational supportive structure crucial for the growth and elasticity of the skin, contributing significantly to the maintenance of physiological functions in the body. The degeneration of the ECM is directly linked to skin aging and is associated with an increase in the activity of specific enzymes involved in skin aging. Reactive oxygen species (ROS) play a pivotal role in numerous cellular mechanisms.

When the skin absorbs UV radiation, it stimulates increased generation of Reactive Oxygen Species (ROS) and triggers oxidative stress. This oxidative damage may result in the formation of lipid peroxides, mitochondrial and DNA damage, as well as alterations in proteins and genes that affect protein structure and function. Elevated levels of ROS activate enzymes such as hyaluronidase, collagenase, and elastase, contributing further to skin aging. The enzyme angiotensin 2 also plays a crucial role in skin photoaging, being involved in wound healing and scar formation. The appearance of scars leads to wrinkles. By employing angiotensin-converting enzyme (ACE) inhibitors, which prevent the conversion of angiotensinogen (inactive) to the vasoconstrictor (active), we can mitigate the effects of angiotensin 2, thus reducing skin aging and wrinkles.

Changes in the skin serve as visual indicators associated with the perceptual experience of aging. Aging factors in visual impressions related to beauty include changes in skin texture, the presence of fine lines and wrinkles, a dull complexion, diminished elasticity and firmness, loss of smooth skin texture, and a decline in skin functions. The perceived age of aging skin appearance is often judged based on visual cues, such as wrinkles, firmness, sagging, tone, radiance, and texture. Importantly, perceived age may significantly differ from chronological age, influenced by life circumstances, lifestyle choices, dietary habits, and various other factors. Facial skin, being prominently visible to others, easily reflects signs of aging. [2-11]

FORMULATION - CREAM FORMULATION

Formulate an oil-in-water (o/w) emulsion as a semisolid formulation. Ensure accurate weighing of all ingredients. Pass Tulsi powder through a 20# 40# sieve, collecting the portion retained on the 40# sieve for a finer powder. Combine the oily and aqueous phases in a mixer, triturating the mixture with the addition of Tulsi powder, olive oil, and Rose oil for fragrance. Maintain constant mixing while gradually adding the remaining distilled water, continuing stirring until the mixture achieves a viscous and opaque consistency.

EVALUATION TEST

1. PHYSICAL APPEARANCE -

In this test, the cream was observed for colour, odour, texture, state.

2. HOMOGENEITY-

In this test, the cream was observed for homogeneity by touch the cream and by appearance.

3. PH-

The pH of the all the formulation cream was checked with the help of pH meter.

4. AFTER FEEL-

In this test, we are apply the same amount of cream on skin of hand and the observed the cream. Emolliency, slipperiness and amount of residue left after the application.

5. REMOVAL-

In this test, we taken small amount of cream apply on skin of hand. After some time wash the hand with tap water and observe the removability of cream.

6. SPREADABILITY-

In this test, we taken the two set of glass slide of standard dimensions. the cream formulation place on one slide and other slide is place on the top of the formulation

Then a weight or certain load was placed on the upper slide so that the cream between the two slides was pressed uniformly to form a thin layer. Then the weight was removed and excess of formulation adhering to the slides was scrapped off and then observed the spread ability of cream.

7. STABILITY-

The purpose of stability testing is to provide evidence on how the quality of drug substance or drug product varies with time under the influence, of variety of environment factors such as temperature, humidity and light and enables to recommended storage condition and to predict the shelf life. Stability for cream was performed at accelerated condition i.e. 40°C ± 2°C.

CONCLUSION

The utilization of natural ingredients in cosmetics has witnessed a significant surge within the personal care system, with a pronounced demand for herbal cosmetics. Bioactive ingredients in cosmetics play a pivotal role in enhancing the biological functions of the skin, providing essential nutrients for maintaining healthy skin. Anti-aging and anti-wrinkle creams work to decelerate skin aging by regenerating and activating cells, offering protection against ultraviolet rays, free radicals, and other external factors. Given the numerous side effects associated with artificial creams, opting for products prepared with natural ingredients is not only safer but also beneficial for the skin. The

results of our study affirm that the formulated anti-aging cream is not only safe but also effective for skincare.

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