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FORMULATION AND EVALUATION OF ANTIOXIDANTS CREAM

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Abstract:

The present study aimed to formulate and evaluate the antioxidant potential of a topical cream incorporating a blend of natural antioxidants, including vitamin E, . The cream was formulated using a combination of oils and waxes, and its physicochemical properties, such as pH, viscosity, and spreadability, were evaluated. The antioxidant activity of the cream was assessed using in vitro assays, including DPPH radical scavenging and ferric reducing antioxidant power (FRAP). The stability of the cream was evaluated over a period of 60 days. Results showed that the formulated cream exhibited excellent physicochemical properties and significant antioxidant activity, with a DPPH radical scavenging activity of 75.23% and a FRAP value of 435.67 μM Fe(II)/g. The cream also demonstrated good stability over the study period. These findings suggest that the formulated antioxidant cream has the potential to provide enhanced skin protection against oxidative stress and damage, making it a valuable addition to skincare regimens.The formulation and evaluation of an antioxidant cream are aimed at developing a topical product that effectively protects the skin from oxidative damage, which is a major cause of premature aging and skin-related disorders. The antioxidant cream was developed using a combination of natural and synthetic antioxidants, including Vitamin C, Vitamin E, and green tea extract. Various formulations were prepared with different concentrations of the active ingredients, and their physical properties, such as color, texture, pH, spreadability, and stability, were evaluated. Additionally, the antioxidant activity was assessed using standard in vitro assays like DPPH Formulations were prepared with different concentrations of the active ingredients, and their physical properties, such as color, texture, pH, spreadability, and stability, were evaluated. Additionally, the antioxidant activity was assessed using standard in vitro assays like DPPH (2,2-diphenyl-1-picrylhydrazyl) and FRAP (Ferric Reducing Antioxidant Power). The final optimized formulation showed promising results in terms of antioxidant activity and stability over time. The cream exhibited good spreadability, desirable texture, and pH suitable for skin application. This study concludes that the developed antioxidant cream has potential as a cosmetic product to protect the skin from oxidative stress and aging, with further clinical evaluation needed for its efficacy and safety in humans

Keywords: *Antioxidants, cream formulation, skin protection, vitamin E, green tea extract, grape seed extract*

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INTRODUCTION:

This study was conduct to purify, isolate, and extract curcumin from the plant curcuma longaand formulate a curcumin containing antioxidant cream. Curcuma longa is family of zingiberaceae curcuma longa contain 3 to 4% of the composition of turmeric. Turmeric is used for treatment in ancient hindu medicine for sprains and swelling. Turmeric is the plant that has been conducted testing as treatment of diseases herbally. Turmeric extract has a lot of potential to overcome diseases such as antioxidants. Antidiabetic anticancer anti-inflammatory, [1]

Fig.No.1 Curcumin Longa

Curcumin can be considered as natural ingredient in food application that provide color and flavour. As well as various health benefits, curcumin have many advantages for prevention or treatment of diseases because it has good safety profile, low cost and low side effect.

Antioxidant cream that help to protect the skin surface from oxidative damage cause by free radical an environmental aggressors like U.V and pollution. Antioxidant are often found in skin care product formulas because of their powerful antiaging agent benefits. The pharmaceutical preparation with topical delivery system is a cream preparation which contain semi-solid dosage form turmeric can be formulated in number of preparation in which one of the dosage form is cream.[2]

Anti-aging cream: Antiaging cream it's help the slow skin aging process aged skin occur in youth new cells fail to replace the accumulation damaged new cells. There are four important ingredients for the anti aging cream. Niacinamide, glycolic acid, vitamin -c, retinol, the antioxidant properties of curcumin have wide ranging pharmacological activities. curcumin protect neural glial cell and renal cell oxidative stress.[3]

Anti-wrinkle cream:

To explore the cosmetics potential utility of curcuma longs numerous attempts have been made including cream, gels, moisturizer etc. to enhances the effect produce by convectional formulation for anti-wrinkle effect, penetration and deposition at required depth into skin have to be considered. By using the concept of rational vesicle design, transfersomes prepared. As the lipid cover the deeper layer of skin transfersomes, due to the presences of surface active agents which are single chain surfactants are optimized to overcome the skin transport barrier spontaneously.[4]

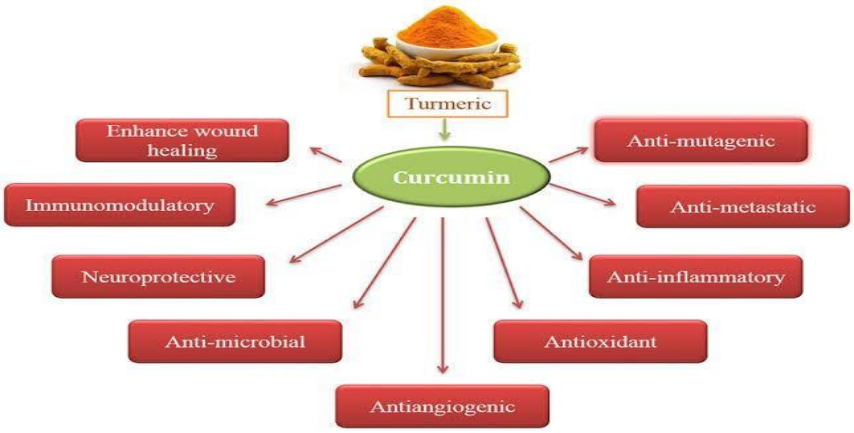

Fig.No.2 Pharmacological Activity of Curcumin

The rhizomes of curcuma longa contain curcuminoids which are used as food additives for the promotion of health as well as for the cure of various type of diseases curcuma and other curcuminoids present in curcuma longa process of variety of physiological and pharmacological activities.

The use of turmeric extract as a cosmetic or skin care product as both topical or oral preparation has been reported. Ti is clamed to be effective in treating skin aging induced by sun exposure, increased thickness and reduction in elasticity of the skin injury other problem.

Curcumin is responsible for most of the action linked with turmeric according Significant study conducted over the last half century, curcuminoids, including a combination of curcumin dimethoxycurcumin, bis dismethoxycurcumin which have been isolated from the rhizome of curcuma longa.[5]

Turmeric contains powerful back centuries in China and India, mainly for medicinal purposes such as treating dermatological infections, stress and depression. Traditionally, to use the ingredienttopically, it is mixed with water or honey to form a paste, then applied directly to the skin, although this can cause the skin to temporarily antioxidants with therapeutic benefits for skin as well, such as healing and preventing dryness and itchiness3 in psoriasis, eczema and acne treatments. Theingredient can additionally slow the process of wrinkle formation.

Instance, it boosts the sun protection qualities of zinc oxide, forming a powerful UVA and UVB blocker. And because it is an antioxidant and anti-inflammatory with free-radical scavenging capabilities, it is ideal in peel formulas, particularly those with retinol. Recent studies demonstrate the versatility of this ancient ingredient.[6]
Turmeric also has valuable impact as a complement to a variety of skin care formulations. ForTraditionally, it is used for the treatment of a wide variety of diseases and conditions including those of the skin, pulmonary and gastrointestinal systems, aches, wounds, sprains and liver. During last half century, extensive research has proved that most of the activities associated with turmeric, are due to curcumin. Phytochemical investigation of the rhizomes of curcuma longa has led to the isolation of pharmaceutically active curcuminoids viz mixtures of curcumin (77-90%). Dimethoxy curcumin (6-17%), bisdemethoxycurcumin (2-4%) as well as volatile oils (turmerone and zingiberone), sugars, proteins and resins.[7]

Turmeric has the ability to both lighten sun damage caused by harmful UV rays throughout Its antioxidant power as well as lighten pigment scarring from burns, acne or any form of Trauma. I believe that turmericis most likely nature's strongest anti-inflammatory in Particular it inhibits the inflammation that causes our collagen and elastin to break downThe group of natural chemicals that occur in turmeric are called curcuminoids, which give the ability to act as an anti inflammatory and inhibit tyrosinase, the primary enzymeThat activates pigment production," explained Boldijarre Koronczay, president of Eminence.

To enhance the effects produced by conventional cosmetic formulations for anti-wrinkle effect, penetration and deposition at required depth into the skin have to be considered. Bangham discovered liposomes in 1963 and since then vesicular systems have attracted increasing attention (Bangham, 1963). But recently it has become evident that classic liposomes are of minor values in term of penetration.

According to the research paper, turmeric leaves also contain bioactive compounds, such as curcumin, several phenolic compounds, and flavonoids. These compounds have been known to act as an antioxidants owing to its effective radical scavenging activity 18. However, there are a limited number of publications detailing the functionality of turmeric leaves. In particular, the effects of turmeric leaves on ROS-induced oxidative stress remain unclear..[8]

Antioxidative nutraceuticals of food ingredients scavenge free Fatticals generated and protect the body by reducing impurity functioning of the immune system and improved vitality against infection. Free radicals are generated inside the body during different biochemical process occurring in the human body. The pharmacological importance of plant is determinedby the amount of biochemicals and ingredients present in the plants. Different types of methodology have been used for the determination, separation and quantification of compounds in plants samples. There are a variety of methods available in the literature for the quantification of curcuminoids and sesquiterpenoids. The fresh turmeric extract has HPLC-UV diode-array and electrospray mass spectrometer method to analyze curcuminoids and sesquiterpenoids.[9]

In the aging process keratinocytes are unable to form

a functional stratum corneum andRate of formation from neutral lipids slows down, resulting in dry pale skin with wrinkle. IN contrast, photo aging is caused by over exposure to UV rays from sunlight. It is Characterized by dry. Pale and shallow skin, displaying fine wrinkles as well as deepFurrows caused by the disorganization of epidermal and dermal components associatedWith elastosis and helio dermatitis. Herbs and plants have already proved useful as aTool in complementary medicine.[10]

CHEMICAL USES:

Cetyl alcohol: It is used as an opacifier, emulsifier, and thickening agent that alter thethickness of the liquid, and increase and stabilize the foaming capacity. Due to its water-Binding property, cetyl alcohol is commonly used as an emient that prevents drying chapping of the skin..[11]

Fig.No.3 Cetyl Alcohol

Turmeric extract:It has anti-inflammatory, antimicrobial and antioxidant properties that help to manage several skin issues like signs of aging, pigmentation, acne, etc.

Fig.No.4 Curcumin Extract

Stearic acid: stearic acid or octadecanoic acid is a saturated fatty acid. It is found in the natural state in various animal fats and vegetable fat (rapeseed oil, soya etc.). it is It is one of the main components of coca butter and shea butter.

It is used in skin care and cosmetic product of the numerous properties and benefits stearic acid is an emollient, emulsifier that is softening the skin and making it more moisture it is also great binding other ingredients together and prevent the skin.

Fig.no.5 Steric acid

Triethanolamine: It is used in skin care products as a formula thickener and emulsify, it is also used to make surfactant in cosmetics as a pH adjuster for skin product[12].

Almond oil: it is full of vitamin E, and it's great of source magnesium phosphours and copper. Due to the emollient properties almond oil has the potential to improve both complexion and skin tone

Fig.no.6 Almond oil

Glycerin: Glycerin can help moisturize and protect the skin

Propylparaben: functions as a preservative in cosmetics and personal care products .[14]

IDEAL RROPERTIES:

- Lightens dark spots
- Heal wounds
- Treats acne
- Turmeric for skin lightening
- Antioxidant
- Calms inflammation
- Moisturises dry skin
- Slow down skin ageing
- Soothes skin condition

ADVANTAGES;

- Build collagen and helps in anti-aging.
- Decrease hyperpigmentation.
- Increase your natural glow.
- It's a potent anti-inflammatory and antioxidant.

DISADVANTAGES

- Skin irritation or Dermatatis may occur due to the drug or excipient.
- May occur Burning, itching, stinging, or soreness.
- Flushed skin and inflammation .[15]

CONCLUSION:

The formulation and evaluation of antioxidant creams demonstrated the potential of natural antioxidants in providing enhanced skin protection. The optimized cream formulation exhibited excellent physical characteristics, stability, and antioxidant activity, promoting healthy and youthful-looking skin. This study contributes to the development of effective and safe skincare products, and its findings can be applied to future research and product development.

Curcuma longa belonging to family zingiberaceae is the one of the most useful medical plant in ancient time. The purpose of this study was to develop a antioxidant cream. Curcumin is a natural pigment obtained from curcuma longa with considered medicinal value.

Formulation showed good spredability. No phase separation and good consistency during the study period. The prepared formulation have proper range is pH 4.5. Stability studies are needed to improve the overall quality of product. In the development of antioxidant creams, incorporating natural extracts has proven effective in enhancing skin protection against oxidative stress and photoaging.

Studies have demonstrated that creams formulated with herbal extracts, such as those from Psidium guajava and Ocimum gratissimum, exhibit significant antioxidant properties, effectively neutralizing free radicals and safeguarding the skin from UV-induced damage.

In conclusion, the incorporation of natural antioxidant extracts into cream formulations not only improves the antioxidant capacity of the products but also offers additional benefits such as moisturizing, anti-inflammatory effects, and enhanced skin protection against environmental stressors. These findings support the potential of such creams in promoting overall skin health and combating signs of aging.

The formulation and evaluation of antioxidant cream demonstrate the potential of using natural antioxidants in skincare products to combat oxidative stress and protect the skin from damage caused by free radicals.

Through the development of a stable and effective antioxidant cream, it was observed that the incorporation of antioxidants such as Vitamin E, Green Tea Extract, and other plant-based compounds can offer substantial benefits in reducing the signs of aging, preventing skin damage, and promoting overall skin health.

Antioxidants, such as Vitamin C, Vitamin E, and other plant-based compounds, have been effectively incorporated into the cream formulations, demonstrating potential for reducing oxidative stress and combating premature aging caused by free radicals. The evaluation of these creams based on their physical, chemical, and microbiological properties indicates their stability, safety, and effectiveness in providing antioxidant benefits to the skin.

The results of the sensory and skin irritation tests suggest that the antioxidant creams were well tolerated, with no significant adverse reactions. The antioxidant activity was proven to be effective in neutralizing free radicals, thereby improving the skin's resilience against environmental damage. In addition, the creams showed moisturizing effects, which further enhanced their overall skin care benefits.

Overall, antioxidant creams are a viable option for improving skin health and preventing oxidative damage. Future research and development should focus on optimizing the formulations, incorporating more potent antioxidants, and exploring various delivery systems to enhance the safety and efficacy of the cream.

REFERANCE:

1. Melak Mohammed, et al., "Development and Evaluation of Herbal Cream Containing from Curcuma Longa", Pharmacy & Pharmacology International Journal, August 2020
2. Kaban Vera Estefania, et.al., "Formulation And Evaluation Of Cream Turmeric Extract Preparation From Turmeric Rhizomes", Indonesian Journal Of Pharmaceutical And Clinical Research, Page No 01- 09, April 2022
3. Simanchal Panda, "Extraction Formulation And Evaluation on Of Antiaging Curcumin Facial Cream", Journal Of Emerging Technologies and Innovative Research, March 2018
4. Swarnlata Saraf, et.al., "Development Of Novel Herbal Cosmetic Cream With Curcuma Longa Extract Loaded Transfersomes for Antiwrinkle effect", Journal Of Pharmacy And Pharmacology, Page No 1054- 1062, June 2011
5. K. Samarasinghe, et.al., "Turmeric Root Powder And Mannanoligosaccharides As Alternative To Antibiotics", Page No 1495-1500, May 2003
6. Jennifer Novoseletsky, et.al., "Jar Deconstructed Turmeric", November 2017
7. Saleemulla Khan, et al., "Development And Standardization Of Turmeric Cream By HPTLC". International Journal Of Biomedical Research. January 2010
8. Chanchal Deep Kaur, etal, "Development Of Photoprotective Cream With Antioxidant Polyphenolic Herbal Extracts", research Journi Of Medical Science, Page
9. Ajay Kumar, et.al., "Antioxidant Efficacy And Curcumin Content Of Turmeric flower", International Journal Of Current Pharmaceutical Research, June 2016

10. Sujith S Nair, et.al., “Formulation And Evaluation Of Herbal Cream Containing Curcuma Longa”, International Journal Of Pharmaceutical And Chemical Science, December 2012
11. https://www.stylecraze.com/articles/triethnolamine-for-skin
12. https://www.healthline.com/healthg/lycerin-for-facehttps://www.thedermreview.com/
13. https://www.neutrogena.com/the-bar/spice-it-up-7-turmeric-benefits-for-skin.html
14. Sailor Niyanta, et.al., “Develpoment And Evaluation Of Herbal Anti-Inflammatory
15. Containing Turmeric”, International Journal Res Ayurveda Pharma, 2022