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Formulation and evaluation of emollient cream from marigold

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Abstract
Emollient cream is a substance that helps soothe, soften and increase moisture levels especially in the skin. Emollients may be used in a lotion, cream, ointment or gel to prevent or treat dry, rough, scaly, itchy skin and other skin problems such as rashes or burns. It provides hydration to the skin and cover the skin with a protective film to trap in moisture. Many emollients contain lipid like white soft paraffin which are ingredients that work as obstructive meaning they create a barrier to help prevent water from getting out of the skin. Some emollients also contain ingredients like urea that act as humectant, which are able to attract moisture to the skin and keep it there. The main aim of the work was to formulate and evaluate emollient cream of *Tagetes erecta* to analyze its emollient activity. *Tagetes erecta* was formulated and tested for emollient activity by topical application. Marigold is the medicinal plant which is richest source of bioactive compounds which is used in traditional and modern. The extracts were used in the formulation. After completion of formulation it was evaluated for its physiochemical parameters like color, odor, PH, spreadability, consistency, solubility, washability, viscosity, the medicinal properties of *Tagetes erecta* since effective and easy which are used in formulation to form cream, ointment and lotion.

Keywords: washability, formulate, soften

Introduction

Herbal Formulations

According definition of WHO herb as being fresh or in dried, fragmented or in powdered form plant materials, which can be further used in formulation to became a final product.

Herbal products are plant derived materials and products with therapeutic activity and other health benefits. Herbal formulation are prepared by extracting active constituents from biological source of herbal plant, herbal preparation are belief to be more potent as well as have very less side effect in compare to any other synthetic chemical preparation and it make the reason for increase in demands for herbal preparation around the world. [1]

Now a day's herbal products are developed and formulated in different dosage forms by the modern pharmaceutical companies and sold in the pharmaceutical market most widely for curing diseases and promoting human health around the world.

Herbal Creams

Herbal creams are defined as semisolid preparations consists of emulsion system, prepared usually for application to the skin, herbal creams are semisolid emulsion of oil and water, classified into two types O/W (oil in water) and W/O (water in oil). Herbal extracts are used in herbal cream preparations to protect skin, to enhance beauty and to cure disease.

Skin Physiology

Skin to be considered to be the single largest organ of the human body, which combines the different many organs like mucosal lining of respiratory organ, digestive organ and urino-genital tract to form compact internal structure which separates it from external environment. Skin is the heaviest organ in the body which is multi-layered organ that is composed of many histological layers. Generally described in the form of three major layers - Epidermis layer, Dermis layer and Hypodermis layer.[2]

Epidermis

Epidermis is classified as the upper most part of the skin which is consist of epithelial cells and doesn't contain of blood vessels, the main function of epidermal cells is to provide protection, hemostasis and absorption of nutrients to the skin.

Dermis

Dermis is the intermediate layer of skin between epidermis and hypodermis which is composed of dense irregular connective tissue of collagen and elastin.

Hypodermis

Hypodermis is the layer just after the dermis layer helps in connecting the skin to fibrous tissue, it is consist of loose, areolar connective tissues and adipose tissues functions as insulator and cushions to the integument. [2, 3, 4]

Marigold *(Tagetes erecta)*

Marigold *(Tagetes erecta)* belongs to family Asteraceae. The biological source of marigold is flower and aerial part of the plant *Tagetes erecta*. Marigold is a natural toner, it shrinks pore size and tightens and firms skin.

Tagetes species vary in size from 0.1 to 2.2m tall. Most species have pinnate green leaves. Blooms naturally occur in golden, orange, yellow and white colors, often with maroon highlights. Floral heads are typically (1-) to 4-6 cm diameter, generally with both ray florets and disc florets. [5]

Fig 1: Marigold

Organic marigold has purifying properties which make it perfect for the skin care. These properties helps to remove impurities, detoxifies the skin and leave it feels clean and clear. Marigold plant has linoleic acid content which is naturally anti-inflammatory and works wonder for sensitive skin. Also enhance skin firmness and provide hydration to skin. [6]

Bees wax is an important component of cream which gives solidity to emulsified solutions and increase the water holding capacity of ointments and creams.

Castor oil contain triglycerides. These can help in maintain moisture in the skin, making it a useful treatment for dry skin. It keeps the skin moisturizing. [7]

Glycerin is a humectant, a type of moisturizing agent that pulls water into the outer layer of your skin from deeper levels of the skin and the air.

Borax helps a number of product act to inhibit microbial growth on and in the skin as well. In cream formulation borax is used as emulsifying agent. [8]

Vitamin E applied to your skin helps to protect delicate skin from damage due to its antioxidant properties. It is used as preservative and rose water is used as perfumery agent in cream formulation.

Chemical Constituents of Marigold

The active ingredient present in marigold plant includes beta carotene, lycopene, lutein, zeaxanthin, neoxanthin, phytoene, phytofluene, violaxanthin, limonene and alpha cryptoxanthin. [9]

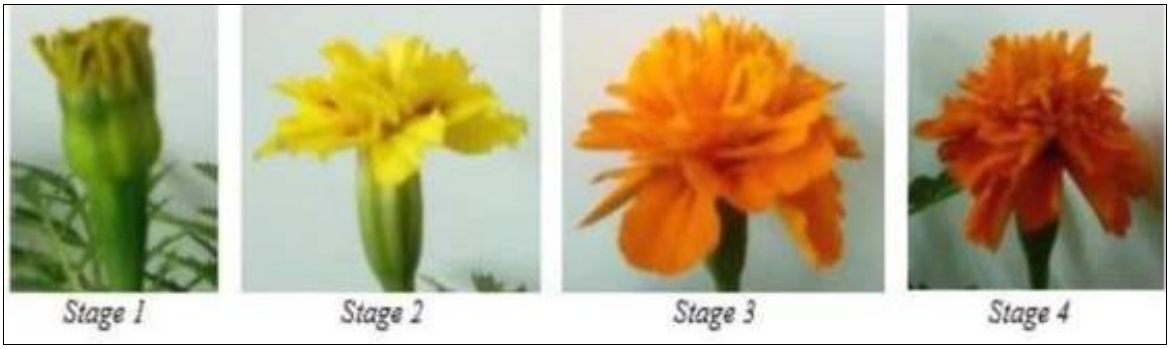

Fig 2: Growth of Marigold Flower

Literature survey

Title

Textbook of pharmacognosy by C.K. Kokate, Purohit Gokhale (2007), 37th edition, Nirali prakashan.

Author Name

1.C.K. Kokate
2. Purohit Gokhale

Summary

They were analyzed for study of natural drug, crude drug with their taxonomical classification and their Indian synonyms, Biological names of natural drugs. Collection and preparation of natural drugs and their evaluation in pharmacopoeial standard.

Phytochemical evaluation and modern analytical techniques for screening of herbal drugs herbal cosmetics and market product.

Title

Mandeep Singh, Shalini Sharma Sukhbir Lal Khokra, Ram Kumar Sahu, Rajendra Jangde, Preparation and evaluation of herbal cosmetic cream, (2011).

Author Name

1.Mandeep Singh
2. Shalini Sharma

Summary

This study report was analyzed for prepare and evaluate herbal cosmetic cream comprising all excipients. The evaluation of all formulation was done on different parameters like PH, viscosity spreadability, rheological study and stability along with irritancy test were examined.

Ideal procedure for extraction of herb was carried out as per given in this article and also analyze the physiochemical characteristics, microbiological study of cream.

Title

International Research Journal of Pharmacy, Dixit Priyanka, Tripathi Shalini, Verma Kumar Navneet, A Brief study on marigold (*Tagetes* species): A Review (2013).

Aim and objectives

1. Aim

To formulate and evaluate Emollient cream from Marigold extract.

2. Needs

Creams are more acceptable to the patients because they are less greasy and are easier to apply. They interfere less with the skin functions. Water in oil type of emulsion rubbed onto the skin more readily and are easily removed by washing.

Emollients are the agents designed to make the stratum corneum softer and more pliable by increasing its hydration. A large number of preparations are available today, many of which are marketed as cosmetic and therapeutic moisturizers. Emollients provide an occlusive barrier for AD skin, retain moisturize and protect it from irritants. Specially formulated emollient products may claim to have anti-microbial, anti-itchy, anti-inflammatory actions.

3. Objectives

- To study and to develop formulation for emollient from natural and easy available resources i.e, Marigold extract.
- To restore the moisture and hydration of skin and improve the skin elasticity.
- To set the formula for herbal cream by using different herbs.
- To evaluate formulated product by using different tests like PH, spreadability etc.
- To develop and optimize formulation containing Marigold extract.
- To nourish and beautify the skin and prevent aging and wrinkles of skin.

Drug profile

1. Marigold Extract

1.1 Scientific Name: *Tagetes erecta*

1.2 Synonym: Aztec Marigold, Mexican Marigold.

1.3 family: Asteraceae

1.4 Chemical Constituent: Beta-carotene, lycopene, zeaxanthin, neoxanthin, phytoene, phytofluene, violaxanthin and alpha cryptoxanthin.

1.5 Uses

1.5.1 Improves the blood circulation.
1.5.2 Prevents pimples and reduces acne scars.
1.5.3 For skin lightening and provide hydration to skin.
1.5.4 Used for anti-aging treatment.
1.5.5 Used as natural antiseptic.

Bees Wax

1. **Scientific Name:** *Ceraalba*
2. **Synonyms:** Yellow Wax
3. **Family:** Apidae
4. **Chemical Constituent:** Myricylpalmitate (80%), free cerotic acid (15%), melissic acid, cerolin.
5. **Uses**

5.1 Used as antibacterial, antifungal.
5.2 It has anti-inflammatory and anti-allergic properties.
5.3 It mainly used as emulsifying agent and stiffener.
5.4 Relieves stress and promote relaxation.
5.5 Relieves pain.

Castor oil

1. **Scientific Name:** *Ricinus communis*
2. **Synonyms:** Ricinus oil
3. **Family:** Euphorbiaceae
4. **Chemical Constituent:** Ricinoleic acid (89.5%), linoleic acid (4.20%), oleic acid (3.0%), stearic acid (1.0%), palmitic acid (1.0%).
5. **Uses**

5.1 Castor oil commonly used as laxative.
5.2 Castor oil promote wound healing.
5.3 Castor oil is cathartic.
5.4 Castor is used in arthritis and joint pain.
5.5 Castor oil helps to improve blood circulation.

Excipient profile

1. **Glycerine**
2. **Scientific Name:** Propane-1,2,3-triol.
3. **Synonyms:** Glycerol, glyceryl.
4. **Chemical Constituent:** Ethanol (2.8%), water (9.3%), diglycerides (1.0%).
5. **Uses**

5.1 It is used as sweetening agent.
5.2 It is used as solvent.
5.3 Used for lubrication.
5.4 Used as humectant.
5.5 Used as preservative.

Rose Water

1. **Scientific Name:** *Rosa rubiginosa*
2. **Synonyms:** Attar of roses, scented liquid.
3. **Family:** Rosaceae.
4. **Chemical Constituent:** Linalool (1.5-3.3%), nerol (0.2-4.2%), geraniol (0.9-0.7%).
5. **Uses**

5.1 Soothes skin irritation.
5.2 Cleanse and brightens skin.
5.3 Moisturizes the skin and provide glow.
5.4 Naturally hydrates the skin.
5.5 Used as perfume in formulation.

Vitamin E

1. **Scientific Name:** d-alpha-tocopherol
2. **Synonyms:** Alpha tocopherol
3. **Chemical Constituents:** Alpha tocopherol, gamma tocopherol.
4. **Uses:** 1. Used as a preservative. 2. Improves immune function. 3. Nourishes the skin. Fights wrinkles. Cleansing agent.

Plan of work

- **Literature Survey:** Literature survey was carried out by Google search and books, research paper, review articles and thesis.

- **Collection of Raw Material:** All the required material for formulation and evaluation i.e, Bees wax, castor oil, borax, glycerin, vitamin E and rose water purchased from market.

- **Methods of Data Collection:** Observation method of data collection will be employed for the collection of data for the present dissertation work. Data for the formulation and evaluation of the herbal Emollient cream will be collected from various standard journals and other sources like research literatures databases such as Springer, Research gate, Google scholar, Yahoo.gov.in etc.

Table 1

Sr. No.	Activity	Tentative Time
1.	Literature Survey	Throughout semester
2.	Selection of drug and excipients	1Week
3.	Authentification of selected herb	1Week
4.	Procurement of drug and excipients	1Week
5.	Experimental work	2Months
6.	Data completion, thesis writing, printing and binding	2Weeks

Materials and methods

Materials

Sr. No.	Ingredients	Role of Ingredient
1.	Marigold Extract	As a Soothener
2.	Bees wax	Base Ingredient
3.	Castor oil	Moisturizer
4.	Borax	Emulsifying agent
5.	Glycerin	Humectant
6.	Rose water	Perfume
7.	Vitamin E	Preservative

Method of Preparation

- **Collection of Herb:** Marigold flower (*Tagetes erecta)* collected from botanical garden of the MIPSRC, college. The collected plant was washed properly by three times in tap water to remove dust and soil particles.

- **Authentication of Herb:** The collected herb given to registered Botanist for Authentification purpose.

Marigold

1. **Kindom:** Plantae
2. **Clade:** Angiosperms (Eudicots)
3. **Order:** Asterales
4. **Family:** Asteraceae
5. **Subfamily:** Asteroideae

Evaluation parameter

Morphological Evaluation:

Sr. No.	Parameters	Observation
1.	Colour	Yellow
2.	Odour	Pleasant
3.	Texture	Smooth
4.	Consistency	Semisolid

Physiochemical Evaluation

1. **PH of Cream:** The PH meter was calibrated using standard solution. About 0.5g of the cream was weighed and dissolved in 50ml of water and the PH was measured.
   The PH of the Emollient Cream was measured to be 5.5

2. **Homogeneity:** The preparation was tested for homogeneity by visual appearance and touch.
   It found to be Homogeneous and uniform.

3. **Type of Smear:** After application of cream, the sort of film or smear formed on skin were checked and sort of cream are not found on the skin.

4. **Irritancy Test:** After application of cream on the skin, the irritation was not found due to cream.

5. **Washability:** The formulation of cream was tested for wash out from skin surface using water. The cream was found to be easily washable with potable/tap water.

6. **Spreadability:** The cream sample was applied between the two glass slides and was compressed between the two glass slides and the ability of cream to spread on skin was checked. The following formula was used for calculation of spreadability, S=M×LT

The spreadability of formulated emollient cream was checked by applied it on skin and it is found to be easily spreadable.

Result

In the present study, the Emollient cream of marigold (*Tagetes erecta)* was formulated, evaluated and submitted successfully by using various excipients. For development of emollient cream F3 formulation batch was confirmed because better result was obtained in F3 batch as compared to F1 and F2 batch and prepared emulsion is of water in oil (w/o) type of emulsion.

The PH of the formulated cream was found to be in range 5 to 7 which is nice recommended for the application on skin. The formulated emollient cream was evaluated for several physiochemical test and also the result were shown. The sort of smear was not formed on the skin and it was not greasy after the application on the skin. The cream were get rid off after application by washing with water. The formulations were able to produce uniform distribution of extract within the cream. It may be present definite by visual inspection and by touch.

The formulated emollient cream easily spreadable with fingers without any roughness felt to touch. The smell of the cream was found to be pleasant. For prepared emollient cream yellowish colour was found and evaluated. After application on skin, the cream shows the activities such as moisturizes the skin, acts as toner for dry skin, provide hydration to skin and reduce skin inflammation.

Table 4

Sr. No	Parameter	Observation
1	Colour and Odour	Yellow and Pleasant
2	Consistency	Semi-solid
3	PH of the cream	5.5
4	Homogeneity	Homogeneous
5	Irritancy Test	No Skin Irritation
6	Washability	Easily Washable
7	Spredability	Easily Spreadable

Conclusion

Frequency of intake of allopathic drugs for the treatment results to produce adverse side effects. Recently, herbal remedies are considered as safe as synthetic one and herbal formulations are having growing demand in the global market. We have attempted the same and the evaluation parameter results showed that use of vitamin E in formulation prevent the oxidation of the cream.

From above study we may conclude that, the extract of marigold contained valuable substances for cosmetics and antimicrobial activity. The extract of marigold shows emollient activity on skin. We recommend that the formulated cream can be successfully used for skin smoothening and hydration.

Thus, this F3 formulation Is suitable for treatment of skin inflammation and for smoothening of skin and give advanced appearance to the skin. In the present work, formulated herbal cream was physiochemically and microbiologically stable and possess characteristics of a standard cosmeceutical's formulation for skin care.

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