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AN COMPLETE STUDY ON POLYHERBAL CREAM FOR SKIN DISEASE USING NATURAL INGREDIENTS

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ABSTRACT

Although superficial wounds are often easy to treat for healthy individuals, there are some more severe types of wounds (burns, ulcers, diabetic wounds, etc.) that are a challenge for clinicians.

The formulation of a herbal cream containing Elipta Prostrata, Calendula officinalis, Arnica Montana leaves, flowers. They are very fast Action on wound healing additional anti-inflammatory property, This multi herbal cream to increase action on that skin disease. In that the calendula officinalis is carried out angiogenesis, glycoprotein and collagen metabolism leading to improvement in both local granulation tissue formation and blood circulation Calendula officinalis *is an annual herb from Mediterranean origin which is popularly used in wound healing and as an anti-inflammatory agent.*

KEYWORDS:- *wound classification, Wound healing, Elicpta prostrate, Calendula Officinalis, Arnica Montana, anti-inflammatory. Angiogenesis*

❖ INTRODUCTION

Wound healing is the process that the skin goes through as it repairs damage from wounds. There are three main types of wound healing, depending on treatment and wound type: primary, secondary, and tertiary wound healing. Every wound goes through various stages of healing, depending on the type of wound and its severity. Wound healing refers to a living organism's replacement of destroyed or damaged tissue by newly produced tissue[1-3].

Treatments

- Medications and other therapy to improve blood flow
- Therapy to reduce swelling
- Wound debridement, or removing dead tissue around the wound to help it heal
- Special skin ointments to help wounds heal
- Special bandages and other skin coverings to help speed up healing[2]

This antiseptic creams can soothe and heal wounds, protect against infection, and treat minor skin problems and skin inflammation. They can be used on cuts, grazes, minor burns and scalds, small areas of sunburn, dry chapped skin, nappy rash, insect bites, spots, and pimples. Some common antiseptic agents.

This cream is polyharbal mixture of four plant to increase the efficacy (The ability of something to produce a desired result or effect) as well as potency also. In that cream including Eclipta prostrate, Calendula officinalis (heal ulceration), Arnica Montana (reduce pain due to injury), Aloe vera (regenerate tissue), herbal extract.

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❖ MATERIALS AND METHODS

Material

Collection of plant materials The dried crude drugs of Eclipta prostrate,Calendula officinalis, Arnica Montana, and extracted Rose hip, extracted powder of Aloe vera

Chemicals and Reagents

The chemicals used during the experiments for formulation of cream. Lanolin, Tween 60, Stearic acid, Triethanolamine, Propylene Glycol, White petrolatum etc were used

Extraction of plant materials

The extractions of crude drugs were carried out by Simple Maceration method using water (aqueous extract) as menstruum with occasional stirring. Liquid mixture is then pressed and to get a clear liquid extract. The clear liquid is then subjected to freeze drying in order to get a solid mass[6].

Formulation of Polyherbal cream (O/W emulsion)

Ingredient of oil phase (A) was melted in a beaker by using water bath on constant stirring. Components of aqueous phase (B) were mixed together and warmed to about same temperature of oil phase. The preservative methyl paraben and concentrated aqueous extract of the plants were added into aqueous phase and heated. Then oil phase was added to water phase little by little on constant stirring and perfume was added to it when the temperature was 350C - 400 C. Six different formulations were prepared by using varying concentration of aqueous extract, stearic acid and liquid paraffin[9]

❖ Formula

Sr No	Ingredients	Formulation % W/W in grams
1.	Eclipta prostrate	2.8
2.	Calendula officinalis	2.8
3.	Arnica Montana	2.8
4.	Aloe vera	1.5
5.	Rose hip	1.5
6.	White petrolatum	0.4
7.	Stearic acid	8.35
8.	Tween 60	2.5
9.	Triethanolamine	0.5
10.	Propylene Glycol	1.75
11.	Lanolin	0.4
12.	Methyl paraben	0.05
13.	Turmaric	0.5
14.	Liquid paraffin	4.15

Table: 1

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❖ **Excipient Uses**

Sr. No	Excipient	Uses
1.	White petrolatum	As a moisturizer to treat or prevent dry, rough, scaly, itchy skin and minor skin irritations
2.	Stearic acid	• Hydration Stearic acid helps lock in moisture to the skin's cells, making it hydrated and firm for longer. It's especially beneficial for people with dry skin. • Skin aging Stearic acid can help reduce the signs of aging and contribute to a more youthful-looking complexion. • Inflammation Stearic acid has anti-inflammatory properties that can help soothe irritated skin and reduce redness. • Skin barrier Stearic acid can help protect the skin's surface against water loss and shore up the skin's protective barrier.
3.	Tween 60	Surfactant
4.	Triethanolamine	Emulsifier. Adding triethanolamine as an ingredient allows chemical bonds to change, which means fluids not easily mixed can be thoroughly processed into one main product. pH adjuster. Stabilizer. Surfactant. Thickener.
5.	Propylene Glycol	Humectant, solvent, emollient or preservative in various skincare products.. It is best known for the attributes of a hydrating and delivery ingredient. This means it retains moisture in your skin and aids in better absorption of potent ingredients into the skin.
6.	Lanolin	Used on the skin to treat or prevent minor skin irritations such as blisters, burns, dry skin, and diaper rash.
7.	Methyl paraben	Methylparaben is a common preservative used in many cosmetic products, including shaving creams, to prevent the growth of bacteria and mold. Other common parabens used in cosmetics include propylparaben, butylparaben, and ethylparaben.
8.	Turmaric	• Moisturizing: Turmeric creams can help moisturize dry skin • Treating stretch marks: Turmeric creams can help treat the appearance of stretch marks • Protecting against environmental damage: Turmeric creams contain antioxidants that can help protect the skin from pollution, sun exposure, and other environmental irritants • Improving skin tone: Turmeric creams can help improve the appearance of skin tone irregularities, like blotchiness, redness, and unevenness • Lightening skin tone: Turmeric creams can brighten skin tone and reduce dark spots and pigmentation
9.	Liquid paraffin	LIQUID PARAFFIN is used to treat eczema and related dry skin conditions. Liquid paraffin is a soothing agent (a substance that soothes or softens the skin). It works by avoiding water loss from the outer coating of the skin. This reduces dryness and leaves the skin hydrated and soft.

Table:2

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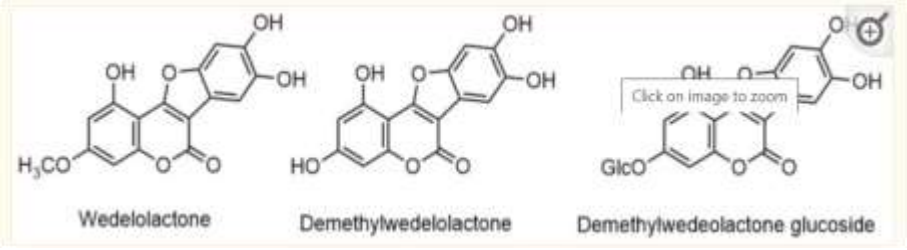
❖ Plant Profile

1) Eclipta prostrate

Eclipta prostrata is a species belonging Euphorbiaceae has been long used by various local communities in the world and Indonesia as traditional medicine and to beauty treatments[4]. Eclipta prostrata (L.) L. (Syn.: Eclipta alba (L.) Hassak, Family: Asteraceae) is commonly known as False daisy or Ink plant in English and locally known as Bhringraj, Bhumiraj, Aali jhar,and Nash jhar in Nepali language. *E.* prostrata is a medium-sized, branched, annual herb-bearing white flower natively found in the tropical and subtropical regions of the world. It grows mostly in moist sites such as swamp edges, river or lake banks and edge of rice-fields and easily propagated and spread throughout China, India, Nepal, Brazil and other parts of the world. It is widely distributed in tropical and sub-tropical regions of Asia, Africa, and South America. Traditionally, it is used to treat different skin problems such as wounds, hair loss prevention, and dermatitis. The leaves are used to treat snakebite in India, China, and Brazil. The mixture of leaf juice and honey is used to cure catarrh in infants. The juice of E. prostrata is taken orally or applied locally to promote hair growth[5].

Phytochemical

Eclipta prostrata contains a wide range of active phytoconstituents, which includes coumestan derivatives, triterpene saponins, steroidal saponins, triterpenes, steroids, steroidal alkaloids, flavonoids, phenolic acids, thiophene derivatives and many other compounds. Most of the chemical analysis are reported for whole plant or aerial parts. The detailed list of these compounds. The structures of main coumestan derivatives, triterpene saponins and flavonoids are represented respectively[6].



Therapeutical uses

- The whole plant is used as antiseptic, febrifuge, tonic, deobstruent in hepatic and spleen enlargement and is emetic.
- In combination with aromatics, the juice is given in anemia, catarrh and cough.
- The plant is also used as scalp tonic for promoting hair growth.
- Bhringaraj is commonly used as deobstruent to promote bile flow and to protect the liver parenchymatous tissue in viral hepatitis and other conditions involving hepatic enlargement.
- The fresh juice of the leaves is given in the treatment of edema, fevers, liver disorders, and rheumatic joint pains; it is also used to improve the appetite and to stimulate digestion.
- The juice is given with honey to treat upper respiratory congestion in children.

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2) Calendula officinalis

Calendula officinalis, commonly known as marigold is commonly grown in warm temperate regions of the world. It is commonly used for treating nephrotixicity, jaundice, helps in healing wounds and purifying blood and can potentially cure cancer. *C.* officinalis is known to be an antioxidant as well as an inhibitor. Adult female Wistar rats were pretreated with *C.* officinalis flower extract with incorporation of 3-NP. The flower extract acted as an anti-inflammatory, anti-oxidant and estrogenic agent by preventing significant behavioral changes and neuronal loss in the striatum of the brains of adult female Wistar rats[7].

Phytochemical

Flavonoids, triterpenoids, essential oil and **polysaccharides** are the principal constituents of calendula flowers. All groups have been shown to exhibit pharmacological activity and serve to illustrate the difficulty of devising an assay which represents the true therapeutic activity of the drug. The *EP* and *BP* determine the **flavonoid** content, expressed as hyperoside (not less than 0.4%), utilizing the same method as for Birch Leaf. Other assays based on triterpenoid assessment have been described.

The flavonoid mixture involves **quercetin** and **isorhamnetin** derivatives. Triterpenoid saponins (calendulosides) are glycosides based on oleanolic acid-3-*O*-β-d-glucuronide and are present in variable proportions (2–10%) depending on time of harvesting and chemotype. The roots are a richer source than the flowers. These saponins have haemolytic and anti-inflammatory activity. Polysaccharides include a rhamnoarabinogalactan (M_r 15 000; **rhamnose** 24.8%, **arabinose** 34.2%, **galactose** 41.0%) and two arabinogalactans with Antitumour and **phagocytosis** stimulation properties have been reported for the polysaccharide fraction.
Other constituents of the flowers are **triterpene** alcohols (e.g. α- and β-amyrin, calenduladiol, etc.), **sesquiterpenes** and **carotenoids**[7].

Therapeutical uses[5]

- Antimicrobial and antihelminthic effects
- Anti-inflammatory effects
- Antioxidant and photoprotective effects
- Cytotoxic effects
- Genotoxic and antigenotoxic effects
- Cardiovascular effect
- Neuroprotective effect
- Hepatoprotective effect

3) Arnica Montana

- Montana showed anti-inflammatory activity on several inflamed cells in vitro.
- Montana mother tincture and dilutions significantly reduced inflammation.
- Montana mother tincture and 1C had the largest effect on inflammation and ROS.
- Montana 9C only enhanced the migration of fibroblasts in an in vitro system.

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Phytochemical

One hundred and fifty therapeutically active substances are present in *A. montana* plant, i.e. sesquiterpene lactones, i.e. helenalin,11a,13-dihydohelenalin and their short-chain carbonic acid esters (0.3–1% of dry weight in the flower heads, 0.1–0.5% in leaves), flavonoids (0.6–1.7%) by micellar electrokinetic capillary chromatography in the form of flavonoid glycosides, flavonoid glucuronides and flavonoid aglycones; essential oils, composed thoroughly of fatty acids, thymol derivatives, monoterpenes and sesquiterpene. Other constituents of *A. montana* are carotenoids; diterpenes; arnidiol (triterpene); pyrrolizidine alkaloids (tussilagine and isotussilagine); polyacetylenes; coumarins (umbelliferone and scopoletin); phenolic acids (chlorogenic acid, caffeic acid and cynarin, 1.0–2.2%); lignans; dicaffeoyl quinic derivatives (1,3- 3,5 and 4,5 dicaffeoyl quinic acids); and oligosaccharides. It contains sesquiterpene lactones being metacryl, isobutyryl, tygloyl, methacryloyl, isovaleryl helenalin derivatives, apigenin, luteolin, hispidulin, quercetin and kaempferol glycosides in high quantities. Phytochemical study of *A. montana* notifies that the nature and amount of phytochemicals such as caffeic acid derivatives, phenolics and helenalin esters and dihydrohelenalin esters present in the flower heads vary according to climatic conditions (i.e. temperature and rainfall) and altitudinal variations. It has been investigated by many researchers that flowers of the plant are mainly rich in active constituents The content and nature of sesquiterpene lactones vary with altitude. The flowers collected from high-altitude healthlands contain principally helenalin esters while the flowers from lower altitude meadows contain dihydrohelenalin esters in large amount. In another study, the effect of ecological factors has been investigated on the content of sesquiterpene lactones in 10 German healthlands. Higher content of sesquiterpene lactones (0.59–1.10%) was found in the flower heads collected from the foothills of the Alps[8].

Therapeutical uses

Arnica is used topically for a wide range of conditions, including bruises, sprains, muscle aches, wound healing, superficial phlebitis, joint pain, inflammation from insect bites, and swelling from broken bones. More recent studies suggest it may also be helpful in the treatment of burns.

❖ **Pharmacology**

In this cream was very broad spectrum (effective against a wide range of organisms) activity for the skin disease, hemostasis, inflammation, proliferation, and remodeling.

- Hemostasis

The body stops bleeding by forming a clot, which usually takes a few minutes.

- Inflammatory

The body cleans and protects the wound, which usually takes 4-6 days. Neutrophils kill bacteria and release antimicrobial substances, while monocytes mature into macrophages that eat bacteria, dead neutrophils, and damaged tissue.

- Proliferation

The body rebuilds the wound with new tissue, which usually takes 4-24 days. Macrophages produce substances that cause the body to produce new tissue and blood vessels, and the wound edges slowly contract and move closer together.

- Maturation

The body strengthens the repair, which can take 2 to 5 weeks.

Factors that can prevent wounds from healing or slow the process include:

- Infection
- Diabetes

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- Poor blood flow
- Obesity
- Age
- Heavy alcohol use
- Insufficient proteins and calories

A healthy wound will have predominantly red tissue within the base, which means that healing is occurring, and that adequate blood flow and oxygen are being delivered. Excessive red color surrounding the wound may be an indication of infection (cellulitis).

❖ **Evaluation Test**

Physical test

In this test, the cream was observed for color, odor, texture, state[10] (table 3)

Spread Ability

The spreadability was expressed in terms of time in seconds taken by two slides to slip off from the cream, placed in between the slides, under certain load. Lesser the time taken for separation of the two slides better the spreadability. Two sets of glass slides of standard dimension were taken. Then one slide of suitable dimension was taken and the cream formulation was placed on that slide. Then other slide was placed 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. The upper slide was allowed to slip off freely by the force of weight tied to it. The time taken by the upper slide to slip off was noted. Show in [10](table 6)

Spread ability= m × l/t

Where,

m= Standard weight which is tied to or placed over the upper slide (30g)

l= length of a glass slide (5 cm)

t= time taken in seconds.

Viscosity

Viscosity of cream was done by using Brooke field viscometer at the temp of 25°C.using spindle no, 63.at rpm. Show in (table 6)

Phase separation

The prepared cream was transferred in a suitable wide mouth container. Set aside for storage the oil phase and aqueous phase separation were visualizing after 24h. (table 6)

Determination of pH:

Take 0.5 g of cream and dispersed it in 50 ml distilled water. Then check it's pH by using digital pH meter Show in[11] (table 6)

Wash ability

A small amount of cream was applied on the hand and it is then washed with tap water show in[10] (table 6)

Irritancy

Mark the area (1 cm^2) on the left-hand . Then the cream was applied to that area and the time was noted. Then it is checked for irritancy, erythema, and edema. Show in [10](table 4)

Test for microbial growth in formulated Cream[12]:

The Formulated Creams were inoculated on the plates of agar media by streak plate method and a control was prepared by excluding the cream. The plates were placed into the incubator and are incubated at 37°C for 24 hours. After the incubation period, plates were taken out and checked for the microbial growth by comparing it with the control.Show in (Table: 5)

Result and Discussion

Formulated herbal cream was evaluated by various standard parameters and found acceptable in all limits. The colour was found greenish brown, semisolid consistency, easily washable with good extrudability. The pH, viscosity and spreadability of formulated herbal cream was found 6.8, 31869 and 22.8 respectively. There is no microbial growth and oil separation in prepared formulation. All the findings were reported in table

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- **Physical test**

Sr No	Parameter	Formulation
1.	Colour	Greenish brown
2.	Odor	unpleasant
3.	Texture	Smooth
4.	State	Semisolid

Table: 3

- **Irritancy**

Irritation	Erythema	Edema
Nil	Nil	Nil

Table:4

- **Test for microbial growth in formulated Cream:**

Microbial Growth	Nil

Table:5

- **Other test**

Sr No.	Test	Infareance
1.	**Spreadability**	22.8 g×cm/sec. in 10 min
2.	**Viscosity**	31869
3.	**Phase Separation**	Nil
4.	**Determination of pH**	6.8
5.	**Wash ability**	Easy washable

Table:6

Shivhare et al Asian Journal of Pharmaceutical Research and Development. 2020; 8(1): 73-78
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CONCLUSION

Plants or chemical entities derived from plants need to be identified and formulated for treatment and management of wounds. In this direction, a number of herbal products are being investigated at present. Obtained findings collectively demonstrated that formulated herbal cream possesses wound healing activity and this justifies its use for treatment of wounds. The observed efficacy may possibly be attributed to the presence of different phytoconstituents found in the extracts which are known to contribute in the wound healing properties of these medicinal plants

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