WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 11, Issue 8, 646-660. Research Article ISSN 2277– 7105

FORMULATION AND EVALUATION OF POLYHERBAL CREAM

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Article Received on
27 April 2022,

Revised on 17 May 2022,
Accepted on 07 June 2022

DOI: 10.20959/wjpr20228-24274

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ABSTRACT

Equisetum arvense, Azadirachta indica, Emblica officinalis Syzygiuma romaticum, Trigonella foenum-graecum, Curcuma longa, Aloe vera are medicinal plants used traditionally from ancient year in the various herbal medicinal system such as Ayurvedic, Homeopathic and Siddha. The whole plant of Equistem arvense, Azadirachta indica, Emblica officinalis Syzygiuma romaticum, Trigonella foenum-graecum, Curcuma longa, Aloe vera have anti-inflammatory analgesic activity. The present research was focus on the formulation of polyherbal cream and their evaluation by using various evaluation parameters of the present research are to formulate polyherbal cream and to evaluate the polyherbal cream. Methods: the slab method was used for the preparation of cream. Results: The evaluation parameters are coming under this heading physical parameter like color was slightly white green, the odor was characteristics, consistency was smooth and the state was semisolid. PH of the cream was 6.5; Spreadability was 7.4g. cm/sec time required for this test was 15 sec, Washability was easily washable, the cream was nonirritant, viscosity of the formulated cream was 39010 cps and no phase separation was observed during storage of polyherbal cream. Conclusion: This cream formulation was used in acne for antibacterial property. This cream formulation was o/w type of emulsion; hence this formulation was easily washed with plane water after application.

KEYWORDS: Equistum Arvensae, Azadirachta indica, Emblica officinalis Polyherbal cream, Soxhlet apparatus, Maceration.

INTRODUCTION

Psoriasis is a common inflammatory skin disease. Psoriasis is a systemic disease, meaning that it not only affects the skin but rather several parts of the body.[1] Psoriasis arthropathy (PsA) affects between about 7 and 30 percent of patients with psoriasis.[2,4] Moderate to

severe psoriasis has also been associated with cardiovascular disease,[5] crohn's disease,[6] depression,[7] and other comorbidities.

Psoriasis fluctuates between periods of inflammation and remission. Psoriasis severity is related to seasonal variation as sunlight exposure reduces inflammation. Life-style choices, such as smoking and high alcohol consumption, may have a negative impact on the disease,[8] as well as obesity and stressful life events,[9,10] There is a strong genetic factor in psoriasis, were first-degree relatives increases the risk of developing psoriasis.[11]

Psoriasis has a major negative impact on health-related quality of life (HRQOL), which is not always in proportion to the clinical severity of the disease.[12,14]

Episodes of increased disease activity may be associated with growth of existing lesions or appearance of new lesions.[15] Psoriasis is primarily a clinical diagnosis ascertained by a combination of features, morphology and configuration of skin lesions. The reference standard for diagnosing the disease is a clinical diagnosis made by a dermatologist.[16]

Topical treatments include creams, ointments, and foams that are applied to the areas of skin affected by psoriasis.[17] They are often effective with relatively benign side-effects profile, albeit skin atrophy is a theoretical concern with long-term use of topical corticosteroid. Topicals may also be used as augmentation to other treatments. One disadvantage is that their application may be time consuming and have adverse cosmetic properties, resulting in low adherence and almost 50% of first prescriptions for a previously untried topical medication for psoriasis are never collected from the pharmacy.[18] The most frequently used topicals for psoriasis are corticosteroids, vitamin D3 analogues, and fixed dose combinations of vitamin D3 analogues and corticosteroids. Other topicals such as retinoids (tazarotene), coal tar, and dithranol are available, but used less frequently given their comparatively burdensome applications.

The demand for herbal or Ayurvedic formulations has increased significantly in the last few years. People encounter a number of skin and hair disorders due to the modern world's changing food habits and increased stress levels. The poor environmental conditions can also be attributed to rising cosmetic issues. Since these factors are unavoidable, therefore there is a need for a treatment that could counter all the problems in a much safer way.[19] The antifungal, as well as conditioning properties of the plant extracts, make them an effective

alternative to chemical agents in various natural anti-microbial formulations.

Present study mainly focuses on the evaluation of efficacy of various plant extracts such as Equisetum arvense, Azadirachta indica, Emblica officinalis Syzygiuma romaticum, Trigonella foenum-graecum and Aloe vera against the isolated microorganisms from scalp and lesions of patients and formulate polyherbal cream and lotion for scalp psoriasis.

Cream formulation was semisolid formulations intended for topical application. The cream formulations were prepared by using various herbal extracts, herbal oils, and various excipients. There are two main types of cream formulation, such as oil in water (O/W) type of emulsion and water in oil (W/O) type of emulsion. The present formulation was oil in water (O/W) type of emulsion. The cream formulation was various other classes like foundation cream, cleansing cream, cold cream, pain-relieving cream, night and massage cream, head and body cream, vanishing cream and shaving cream.[20] The Ayurvedic system of medicine was one of the most important system that uses herbal plants and extracts for the treatment of management of various diseases and diseased states.[21]

Equisetum arvense (Horsetail): Is a perennial fern that belongs to family Equisetaceae. In folk medicine, Equisetum arvense is used for tuberculosis, as a catarrh in the kidney and bladder regions, as a hematostatic for profuse menstruation, nasal, pulmonary and gastric hemorrhages, for brittle fingernails and loss of hair, for rheumatic diseases, gout, poorly healing wounds and ulcers, swelling and fractures and for frostbite. The plant is reported to contain a number flavonoids, alkaloids, minerals, phenolic petrosins, triterpenoids, saponins, phytosterols. Horsetail as functional skin remedy No other herb in the entire plant kingdom is as rich in silicon as is horsetail. Equisetum arvense extract is used as a collagen promoting agent in cosmetics.[22] Horsetail (herb): is considered to be the best possible tonic to cure acne and eczema, known to provide excellent healing effect for most skin conditions.[23] Horsetail is that kind of rare and unique cosmetic agent which beautifies from the inside out rather than just externally. Mature skin or skin that shows signs of premature aging may fall into this category.[24] Horsetail improves the texture and tone of skin. Horsetail extract is used in cosmetics as an anti-aging agent along with UV adsorbents. Some even ascribe to this herb a certain hidden "youth factor". Horsetail is also used as in cosmetics as a moisturizer and skin conditioning agent. The extract is used in a cleansing composition suitable for use in body shampoo, hand soap, cosmetic cleanser, and hair shampoo, etc.[25]

Fig. 1: Equisetum arvense (Horsetail).

Neem (Azadirachta indica): Is a member of the Meliaceae family and its role as health-promoting effect is attributed because it is rich source of antioxidant. It has been widely used in Chinese, Ayurvedic, and Unani medicines worldwide especially in Indian Subcontinent in the treatment and prevention of various diseases. Earlier finding confirmed that neem and its constituents play role in the scavenging of free radical generation and prevention of disease pathogenesis. The plant has therapeutics implication in diseases cure and formulation based on the fact that neem is also used to treat various diseases. Azadirachta indica has complex of various constituents including nimbin, nimbidin, nimbolide, and limonoids and such types of ingredients play role in diseases management through modulation of various genetic pathways and other activities.[26]

Fig. 2: Azadirachta indica (Neem).

Emblica officinalis: Commonly known as amla, is arguably one of the most important plants in various traditional and folk systems of medicine in India. In Ayurveda, amla is considered to be a potent rejuvenator and immunomodulator effective in stalling degenerative processes and senescence, and to promote longevity, enhance digestion, treat constipation, reduce fever

and cough, alleviate asthma, strengthen the heart, benefit the eyes, stimulate hair growth, enliven the body, and enhance intellect. Amla fruits commonly known as gooseberry with its seeds are a rich source of vitamin C. It is a very popular ingredient of the Indian recipe for hair care. The fixed oil of the berries could be used as a hair tonic. It could be prepared in the form of shampoo or hair oil. The Amla fruits could be cut and boiled with coconut oil for prevention of hair graying. Amla could also be beneficial as a sun protection agent.[27]

Fig. 3: Emblica officinalis.

Amla is shown to offer protection against hepatotoxicity by a wide variety of agents such as ethanol, paracetamol, CCl4, heavy metals, ochratoxins, hexachlorocyclohexane, and antitubercular drugs. Treatment with amla is shown to be beneficial in mitigating hyperlipidemia, metabolic syndrome, hepatocarcinogenesis, and hepatotoxicity resulting from iron overload. The phytochemicals of amla, quercetin, gallic acid, corilagin, and ellagic acid were observed to exert hepatoprotective actions against toxicity of paracetamol, microcystins, galactosamine, and lipopolysaccharide. Amla appears to possess hepatoprotective effects by virtue of its antioxidant, anti-inflammatory, and hypolipidemic actions and by modulation of detoxifying enzymes.[28]

Eugenia caryophyllus: Was the aromatic plant, flower buds of the plants are used for various activities. The Eugenia caryophyllus belongs to family Myrtaceae. The tree of the clove is evergreen and grow up to 8-12 m. The flower buds are firstly pale in color and gradually become green after which they develop into dark brown or dusty red. Eugenia caryophyllus were traditionally used as anti-inflammatory and pain-relieving activity, also dental analgesic, used in the preparation of various marketed formulations like cream paste etc. clove oil specifically used as a pain reliving ingredient present in cream. This plants were show antibacterial, antimicrobial, antifungal and anticancer properties.[29]

Fig. 4: Eugenia caryophyllus (Clove).

Zingiber officinale (Ginger): Is traditional medicinal plant belongs to family Zingiberaceae. The part of the plant roots and rhizomes having anti-inflammatory and pain reliving activity. The fresh rhizomes are used for the extraction purpose; extract were used for the preparation of cream. Ginger were used for various purposes like anti-oxidant, anti-cancer, antimicrobial, skin-nourishing properties. Ginger is primarily used to treat nausea, but it is also used as an anti-inflammatory, a pain remedy, a warming remedy and a cholesterol-lowering herb.[30]

Fig. 5: Zingiber officinale (Ginger).

Trigonella foenum graecum L.: Is an annual herbaceous Mediterranean plant that produces long pods containing oblong, brownish seeds. It has been commonly used as a traditional food and medicine. The seeds and the leaves have a strong aroma. Fenugreek is used as spices in food or as flavor in curry powder, or as a condiment in artificial flavoring of maple syrup or in production of steroid and hormone, for the pharmaceutical, nutraceutical, and functional food industries. The leaves from the plant (often sold as methi) can be used in salads, and both fresh and dried leaves are used in Indian cookery. It has also been used in tea and as food preservative in sauces and pickles. The plant contains active constituents, such as alkaloids (trigonelline, choline, carpaine), flavonoids (naringenin, lilyn, kaempferol, vecenin-1, tricin 7-O-D glucopyranoside, saponaretin, isovitexin, isoorientin. orientin, vitexin,

luteolin, quercetin), cumarins (methyl coumarin, trigocumarin, trimethyl coumarin), steroids, saponins (fenugrin, foenugracin, glycoside, yamogenin, trigonoesides, smilagenin, gitogenin, sarsasapogenin, yuccagenin, hederagin, diosgenin, tigonenin, neotigogenin) and other antioxidants. It contains a major class of phenolics like gallic acid, protocatechuic acid, catechin, gentisic acid, chlorogenic acid, vanillic acid, and syringic acid. Fenugreek is better known for the benefits obtained from its external use. The paste can help get rid of skin irritation, wounds, muscular pains, scars, and so on. It is also used as a beauty product in face packs to remove pimples and blackheads. Fenugreek is known to have hypoglycemic, and hypocholesterolaemic, effects, antiinflammatory effects.[31]

Fig. 6: Trigonella foenum graecum L (Methi)

Aloe vera (Aloe barbadensis miller)

Aloe vera is called “the plant of immortality.” It is widely used in dermatology in the form of skin lotions, gels, and ointments for treatment of minor sun burns. The main active ingredients are vitamins (A, B12, C, and E), enzymes (aliiase, alkaline phosphatase, and amylase), anthraquinones, bradykinase that reduce skin inflammation upon topical use, steroids (cholesterol, campesterol, and B-sitosterol), glucomannan “mannose polysaccharide,” and gibberellin “growth hormone” that enhance collagen synthesis after dermal topical use besides its antiinflammatory action due to cyclooxygenase inhibition and prostaglandin E2 reduction. Aloe vera is also commonly known for its wound healing, sun protection, antiaging, and a cure for alopecia and baldness.[32]

Fig. 7: Aloe vera.

MATERIALS AND METHODS

Collection of plant material

The raw material for extraction included plant Equisetum arvense, Azadirachta indica, Emblica officinalis, Eugenia caryophyllus, Zingiber officinale, Trigonella foenum-graecum and Aloe vera. These plant material were collected from the local market and shade dried before extraction.

The essential oils (EO) required for testing and formulation of the product were obtained from the store of Dehradun.

Extraction: The shade dried and coarsely powdered whole plant of Equisetum arvense fruit of Emblica officinalis and seeds of Trigonella foenum graecum were extracted using water. The extract was then filtered and concentrated in the vacuum at 40-50^{0}C which produced a crude extract. This filtrate was used for the preparation of cream.

Formulation of cream

Formulation can be prepared by adding two different phases which are as follows.

Phase 1: Melt the solid ingredients by indirect heat then add all the oils in it and stir well.

Phase 2: Dissolve the borax in water with the help of heat.

While still hot add the phase 1 into the phase 2 gradually with constant stirring to the wax and oil mixture. Continue this process for 5 minutes, stir all the time then remove from the heat and stir until it gets cold. As compare to other creams this cream may be made heavier by adding more wax. Continuous stirring was done until semisolid mass was formed. The formed mass was taken on slab and maintain its smooth consistency by rubbing spatula on the slab. The formed cream was further evaluated.

The formula for the cream is given in table 1.

Table 2: Formula of cream formulation.

S. No	Ingredients	Quantity
1	Equisetum arvense Extract	1 gm
2	Azadirachta indica	0.4ml
3	Emblica officinalis Extract	0.5 gm
4	Eugenia caryophyllus	1.5ml
5	Zingiber officinale	1.5ml
6	Trigonella foenum-graecum	0.5 gm
7	Aloe vera	0.5 gm
8	Bees Wax	2.8 gm
9	White soft Paraffin	10 ml
10	Borax	0.3 gm
11	Methyl Paraben	0.03gm
12	Distilled water	qs
13	Menthol	qs

Evaluation of cream

The evaluation of herbal cream was following.

Physical evaluation

Formulated herbal cream was further evaluated by using the following physical parameters. Color, Odor, Consistency, and state of the formulation.[33]

a) Color: The color of the cream was observed by visual examination.

b) Odor: The odor of cream was found to be characteristics.

c) Consistency: The formulation was examined by rubbing cream on hand manually. The cream having smooth consistency. Cream did not leave greasy substances on skin surface after application.

d) State: The state of cream was examined visually. The cream having a semisolid state.

pH: pH of prepared herbal cream was measured by using digital pH meter. The solution of cream was prepared by using 100 ml of distilled water and set aside for 2 h. PH was determined in three time for the solution and the average value was calculated.

Spreadability: Spread ability of formulated cream was measured by placing sample in between two slides then compressed to uniform thickness by placing a definite weight for a definite time. The specified time required to separate the two slides was measured as Spreadability. Lesser the time taken for separation of two slides result shown better Spreadability. Spreadability was calculated by the following formula:

Spread ability=m *l/t

Where S= Spreadability M= Weight tide to the upper slide L= Length of glass slide T= Time taken to separate the slides.[34]

Washability: Formulation was applied on the skin and then ease extends of washing with water was checked. Results were shown in table 2 Non-irritancy test Herbal cream formulation was evaluated for the non-irritancy test. Observation of the sites was done for 24 h 28. Results were shown in table 2.

Viscosity: Viscosity of cream was done by using Brooke field viscometer at the temp of 25 °C using spindle no. 63 at 5rpm.

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.

Saponification value: Take 2 gm of the substance and reflux it with the 25 ml of 0.5 N alcoholic KOH for 30 minutes. Then add 0.1 ml of phenolphthalein as a indicator and titrate it with the 0.5 N HCL.

Saponification value=(b-a) *28.05/W

a =volume of titrate, b =volume of titrate, w =weight of substances in grammar

Acid value: Take 10 gm of the cream dissolved in accurately weighed in 50 ml mixture of the equal volume of alcohol and solvent ether. Then attached the flask with the condenser and reflux it with the slow heating until the sample gets completely dissolve then add 1 ml of phenolphthalein and titrate it with 0.1 N NaOH until it gets faint pink color appears after shaking in 20 seconds.

Acid value=n*5.61/w

w =weight of the substances

n =the number of ml in NaOH required.

Dye test: The scarlet red dye is mixed with the cream. Place a drop of the cream on a microscopic slide then covers it with a cover slip, and examines it under a microscope. If the disperse globules appear red the ground colorless. The cream is o/w type. The reverse condition occurs in w/o type cream i.e. the disperse globules appear colorless.

Homogeneity: Homogeneity was tested via the visual appearance and test.

RESULTS

The present research was the formulation and evaluation of polyherbal cream. The evaluation parameters were coming under results, like the physical evaluation of polyherbal cream, pH of the cream, Spreadability, Washability, non-irritancy test, viscosity and phase separation of the polyherbal pain reliving cream was shown in table1

Physical properties: The physical properties of formulated cream were judged by color, odor and texture.

Washability: The cream applied on skin was easily removed by washing with tap water.

pH of the cream: The pH of the cream was found to be in range of 5.6 to 6.8 which is good for skin pH. The herbal formulation was shown pH nearer to skin required i.e pH 6.8.

Viscosity: Viscosity of formulated cream was determined by brook field viscometer at 20 rpm using spindle no. LV-4(64). The viscosity of cream was in the range of 499990 to 30000cp which indicates that the cream is easily spreadable by small amount of shear. The formulated cream shows the viscosity within range i.e. 48890cp.

Spread ability test: The spread ability test showed that the formulated cream has good spreadable property.

Irritancy test: The formulated cream shows no redness, edema, irritation and inflammation during studies. The formulated cream is safe to use.

Saponification value: The saponification value results of formulated cream was 22.4 and showed satisfactorily values.

Acid value: The acid value results of formulated cream was 5.8 and showed satisfactorily values.

Dye test: The scarlet red dye is mixed with the cream. Place a drop of the cream on a microscopic slide covers it with a cover slip and examines it under a microscope. The disperse globules appears colorless in the red ground i.e. w/o type cream.

Homogeneity: The homogeneity of the formulated cream was judged by the visual appearance and touch. The appearance and touch of the cream was good.

Table 1: Summary of formulated poly herbal cream.

S. No.	Parameters	Results
1	Colour	Slightly pale yellow
2	Odour	characteristics
3	Consistancy	Smooth
4	State	Semisolid
5	pH	6.5
6	Spreadability	7.4 g.cm/sec

7	Washability	Easily washable
8	NonIrritancy Test	Non-irritant
9	Viscosity	49990-30000cp
10	Phase separation	No phase separation
11	Saponification value	22.4
12	Acid value:	5.8
13	Dye test	colorless

DISCUSSION

The present work was the formulation and evaluation of polyherbal cream. The present work was focus on the lesions of psoriasis patients and revealing pain activity of herbal extracts. This cream formulation was o/w type of emulsion; hence this formulation was easily washed with plane water after application. The prepared formulation was good Spreadability. Viscosity and pH of the cream was good. Cream does not show any type of phase separation during storage. The cream was non-grassy in nature and easily removable after application. The formulation was Nonirritant and not harm to the skin.

CONCLUSION

From the above results it is concluded that the formulated cream showed good consistency and spread ability, homogeneity, pH, non-greasy and there is no phase separation during study period of research. From the above study it can be concluded that the polyherbal cold cream is safe to use as it is developed from herbal extract and may be applied topically against scalp psoriasis.

Natural remedies are more acceptable in the belief that they are safer with fewer side effects than the synthetic ones. So, the values of herbs in the cosmeceutical has been extensively improved in personal care system and there is a great demand for the herbal cosmetics nowadays. An herbal cream which is non-toxic, safe, effective and improves patient compliance by the utilization of herbal extracts would be highly acceptable than synthetic ones.

The Equisetum arvense extract Azadirachta indica, Emblica officinalis Eugenia caryophyllus oil, Zingiber officinale oil and Trigonella foenum-graecum extracts having pain reliving property and prepared in polyherbal cream formulation. Formulation of cream was done by slab method and further evaluated by various evaluation parameters such as physical properties, pH, Spreadability, Washability, non-irritancy test, viscosity and phase separation of cream and gives good results. M has been found to ease the pain of psoriasis and stimulate

the healing of chilblains. It can be used as bathing agent for skin diseases.

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