



COMPARISON OF FORMULATED AND MARKETED HERBAL CRACK CREAM BY EVALUATION PARAMETERS

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ABSTRACT

Skin diseases are numerous and a frequently occurring health problem affecting all ages from the neonates to the elderly and cause harm in number of ways. If the cracks in the heels are deep, they can be painful, hurting when a person stands up, and they may sometimes bleed. Some wild plants and their parts are frequently used to treat these diseases. Herbal crack cream contains the extracts of the plant consists of five ingredients viz., extract of Daruharida (*Berberis aristata* DC.), Pashanbheda (*Bergenia ligulata* (Wall.) Engl.), Jivanti (*Leptadenia reticulata* W. & A.), kampilak (*Mallotus philippensis* Muell.-Arg.), Manjistha (*Rubia cordifolia* Linn.) were used to prepare Herbal crack cream. The main objective of the research work was to prepare and evaluate Herbal crack cream and compare with marketed Herbal crack cream. The results showed that Herbal crack cream passed all Parameters related to cream and TLC of formulated cream and extract and marketed cream showed that the tannins, flavonoids and alkaloids were found to be present in mentioned medicinal plants. Formulated herbal crack cream is as good as marketed herbal crack cream.

Keywords: Ethno medicine, herbs, medicinal plants, skin disease

INTRODUCTION

The skin is the largest organ of the body, with a total area of about 20 square feet. Skin has three layers: The epidermis, the outermost layer of skin, provides a waterproof barrier and creates our skin tone. The cosmetics are the utility product used extensively throughout the world for maintaining and improving general appearance of face and other part of body e.g. skin, eye, hair, hand, etc. herbal cosmetics are the preparation which represent cosmetics associated with active bio-ingredients, nutraceuticals and pharmaceuticals. Cosmetics are products that are used to cleanse and beautify the skin. The first recorded use of cosmetics is attributed to Egyptians in 4000 B.C. Pharmaceuticals are essentially drug products and are defined as products that prevent, mitigate, treat or cure disease and affect the structure or function of the body. The skin underneath your feet is often dry, rough and chapped. Disorders - Athlete's foot, psoriasis, eczema, thyroid disease, diabetes and some other skin conditions can be the cause of cracked heels.

Maintaining healthy skin is important for a healthy body. Natural treatment is cheap and claimed to be safe. A review of some plants for the treatment of skin diseases is provided that summarizes the recent technical advancements that have taken place in this area during the past 17 years. It is also suitable raw material for production of new synthetic agents.

The literature in ayurveda, especially charak samhita stated numerous medicinal plant in varnya kashaya. The herb like chandun, haldi, khas, nagkeshara, manjistha, yastimadhu, are used to obtained glowing complexion and arusa, amla, bavchi, guduchi, chakmard are mentioned as kustaharan. Herbs like amalaki, haridra, khadira, vidyanga, jati saptaparna, karavira of various potential from khshthagna and mahakashiya are mentioned effective in skin disorder. Herbs used in cosmetics preparation have varieties of properties like Antioxidant, Anti-inflammatory, Antiseptics and Antibacterial etc ^{1,2,3,4,5}.

Definition: Creams are semisolid emulsion system with opaque appearance as contrasted with translucent ointments. Cream is used for external purpose.

Creams are intended for application to the skin and mucous membrane. Their consistence depends on whether the,

- (1) Emulsion is water in oil or oil in water
- (2) Nature of solids in internal phase.

Skin care creams can be classified on different basis:

- (1) According to function. E.g. cleansing, foundation, massage etc.
- (2) According to characteristic properties, e.g. cold creams vanishing creams etc.
- (3) According to nature or type of emulsion.

Skin nourishment is important and required to preserve the normal characters of the skin or as a treatment for dry skin.

Experimental Section

Collection of raw material and finished product:

Herbal crack cream consists of six ingredients viz., extract of *Berberis aristata* DC., *Bergenia ligulata* (Wall.) Engl., *Leptadenia reticulata* W. & A., *Mallotus philippensis* Muell.-Arg. *Rubia cordifolia* Linn., *Sesamum indicum* Linn.

The extracts of *Berberis aristata* DC., *Bergenia ligulata* (Wall.) Engl., *Leptadenia reticulata* W. & A., *Mallotus philippensis* Muell.-Arg. *Rubia cordifolia* Linn., *Sesamum indicum* Linn. were procured from Amsar Private Limited, Indore, India. While Herbal crack cream formulated by me in ICPA health product Ltd., Ankleshwar, India. All the extracts used in Herbal crack cream. All these plant's extract were identified and authenticated by Dr. (Mrs) C.R. Bhatt, Analytical chemist, Amsar Private Limited, Indore.

All the reagents and instruments used in Formulation & standardization for Herbal crack cream were facilitated by ICPA Research Centre- A division of ICPA health product Ltd., Ankleshwar and A.R Collage of Pharmacy & ISTAR, Vallabh Vidhyanagar.

Formulation of Herbal crack cream^{6,9,8}:**General preparation of cream:**

Herbal crack cream is cream preparation. Cream preparations are emulsion type. Cream is prepared by taking ingredients of oil phase and aqueous phase separately. Heating to liquefy or dissolve all ingredients and then mixing them together with continuous stirring till the cream is produced and cool down.

Procedure for Herbal crack cream:

Preparation of Phase A and Phase B:

Phase A: Prepare phase A by mixing cetosteryl alcohol, cetomacrogol 1000 B.P, Microcrystalline Wax, Hard paraffin, Liquid paraffin wax, Light liquid paraffin, Propylene glycol, Tail oil, mango butter and heat it up to 80°C.

Phase B: Prepare phase B by taking purified water and start heating at 80°C and add sodium lauryl sulphate slowly with stirring. Add water in oil phase, Phase B in Phase A. Add solution of all extract one by one. Rinse all with water. Cool down the temperature 40°C and continuous stirring. 3 batch of 300 gm and 2 batch of 500 gm.

Evaluation of Quality Control Parameters for Herbal crack cream⁷⁻¹³:--

Organoleptic parameters: Organoleptic parameter like colour, odour and taste of cream were carried out. These parameters helped in visual identity of cream.

Physicochemical parameter:

a. Viscosity: It determines the consistency of crack cream. Viscosity is determine by Brookhold viscosity meter.

b. Determination of pH:

The pH value of a solution was determined potentiometrically by means of a glass electrode, a reference electrode and a digital pH meter. The pH meter was operated according the manufacturer's instructions. First the apparatus was calibrated using buffer of 4, 9 and 7 pH. 1 g cream was taken and dissolved in 10 ml demineralized water. The electrodes were immersed in the solution and measured the pH.

c. Bulk Density at room temperature:

Weight a clean & dry stainless steel bulk density cup. Fill cup with water & again weight to know the weight of water filled. Dry the cup in hot air oven & fill with the paste sample place on bulk density apparatus & stroke times.

Remove any excess paste by cutting with the help of a spatula. Clean paste adhered outside & weigh. Subtract weight of empty cup to know the weight of paste filled. Operate bulk density apparatus.

Calculation:

Bulk density = gm/ml = weight of paste/weight of water same volume.

Charecterastic:**a. Homogeneity:**

Take a transparent glass plate & spread about 1 gram of the paste sample on it. Put another glass plate over it. The paste should spread uniformly. There should not be any unmixed particales or lumps.

b. Fineness:

A particle retained on 150 μ IS sieve. Place about 10 gm of paste, accurately weighted in a 100ml beaker. Add 50ml of water & allow standing for 30min. with occasional stirring until the paste is completely dispersed.

Transfer to a 150 μ IS sieve & wash by mean of a slow stream of running tap water & finally with a fine stream from a wash bottle until all the matter that can pass through the sieve has passed. Let the water drain from the sieve.

Dry the sieve containing residue in hot air oven at 60 $^{\circ}$ c. If there is any residue on the sieve carefully transfer it to a tarred petridish & dry in an air oven at 105 \pm 2 $^{\circ}$ c for 2 hours.

Calculation:

$$\text{Particle retained on sieve \% w/w} = 100 \times M1/M2$$

Where,

M1 = weight of residue retained on the sieve

M2 = weight of the sample taken for test

Particle retain on 75 μ IS sieve: follow same as above.

c. Hard & sharp edged abrasive particle:

Take about 15gm paste sample on a plain paper. Test the paste by spreading on paper by a finger for positive of hard & sharp edge abrasive particles.

The sample shall be free from hand & sharp edge abrasive particle with can be fell by finger.

d. Palatability:**e. Smoothness:****f. Spreadability:****g. Squeeze out property:****Thermal stability:**

Thermal stability of cream measure at 25 $^{\circ}$ C, 30 $^{\circ}$ C, & 40 $^{\circ}$ C.

At 25 $^{\circ}$ C, 30 $^{\circ}$ C, & 40 $^{\circ}$ C there is no any breaking or separation of oil phase.

Sensitivity test and Irritation test:

The prepared herbal Cream was applied on 1 cm skin of hand and exposed to sunlight for 4-5 min.

Identification by TLC method:

RESULT AND DISCUSSION:

Table 1: Formula of Herbal crack cream & Marketed crack cream:-

SRNO	INGRIDIENTS	QUANTITY REQUIERED In FORMULATED CREAM	QUANTITY REQUIERED In MARKETED CREAM	
1	Daruharidra (<i>Berberise aristata</i>)	0.50%	35.4%	
2	Pashanbheda (<i>Bergenia ligulata</i>)	2%		
3	Kampilak (<i>mallotus phillipinensis</i>)	1%		
4	Manjistha (<i>Rubia cardifolia</i>)	1%		
5	<i>Jivanti</i> (<i>Leptadenia reticulate</i>)	1.75%		
6	Tila oil (<i>Sesamum indicum</i>)	3%		
7	Gritha	---		
8	Copper sulphate	---	---	
9	Mango butter	1%		
10	Cetosteryl Alcohol	7.2%		
11	Cetomacrogel 1000 B.P	2%		
12	Liquid paraffin	5%		
13	Propylene glycol I.P	5%		
14	Methyl paraben I.P	0.15%		
15	Microcrystalline wax I.P	2.55%		
16	Hard paraffin I.P	3.15%		
17	Light liquid paraffin I.P	9.3%		
18	Sodium lauryl sulphate I.P	0.6%		
19	Polysorbate 20 I.P	0.1%		
20	Purified water	54.7%		
21	Perfume	0.1%		
22	Vrikshamal	---		3.6%
23	Cream Base	---		Up to 100%
	TOTAL	100.00%		

Table 2: Evaluation of Herbal Crack cream & Marketed crack cream:

Sr No	Physicochemical Parameters	RESULTS FORMULATED CREAM	RESULTS MARKETED CREAM	
1	Color	Light brown	Greyish yellow	
2	Odour	Pleasant Flavour	Pleasant Flavour	
3	Viscosity(P/sec)	13.194	16.567	
4	pH	5.4	5.6	
5	Bulk density(gm/ml)	0.8572	0.8661	
6	Characteristics	Homogeneity	Excellent	Excellent
		Finess	Excellent	Excellent
		Hard & Sharped edged particles	No any Hard & Sharped edged particles	No any Hard & Sharped edged particles
		Palatability	Very good	Very good
		Smoothness	Excellent	Excellent
		Spreadibility	Excellent	Excellent
		Squeezing out	Very good	good
		Removability	Easily remove	Easily remove
7	Thermal Stability	25 °C	Stable	Stable
		30 °C	Stable	Stable
		40 °C	Stable	Stable
		50 °C (stress study)	Stable	Stable
8	Sensitivity test	No irritation	No irritation	
9	Irritation test	No irritation	No irritation	
10	Squeezing out effect	Good	Good	

Identification by TLC method:

Table 3: TLC of ingredients present in Formulated Herbal crack cream:-

Drug Extracts	Main constituent	Solvent	Stationary phase	Mobile phase	Detection	No of Spot	Colour of Spots	Rf Values
Daruharidra	Berberin	Methanol	Silica gel	Toluene:ethylacetate:formic acid: methanol (3:3:0.8:0.4)	366nm UV	6 spots	Blue	0.26, 0.31, 0.37, 0.59, 0.69, 0.78
Pashanbheda	Gallic acid	Methanol	Silica gel	Toluene:ethylacetate:formic acid: methanol (3:3:0.8:0.4)	280nm UV	3 spots	Blue	0.89, 0.87, 0.88
Kampilak	Rottaline	Methanol	Silica gel	Chloroform: ethylacetate (8:2)	Normal light	3 spots	Yellow	0.43, 0.75, 0.96
Manjistha	Tannin	Methanol	Silica gel	Toluene:ethylacetate:formic acid (1:1:0.1)	373nm UV	3 spots	Green	0.35, 0.36, 0.35
Jivanti	Flavanoid	Methanol	Silica gel	Toluene:ethylacetate:formic acid(1:1:0.1)	260nm UV	3 spots	Black	0.66, 0.71, 0.65

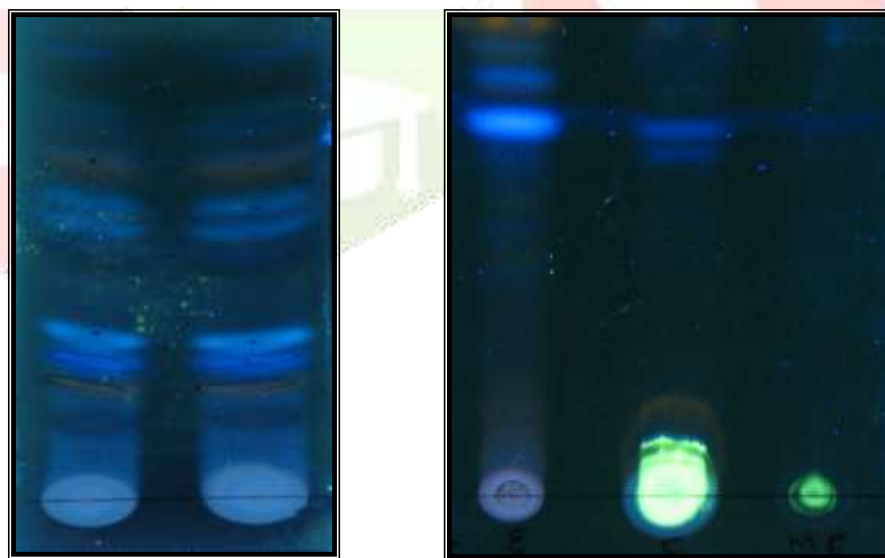
Daruharidra extract, Pashanbheda extract, Kampilak extract, Manjistha extract, Jivanti extract have berberine, gallic acid, resinous coloring matter rottaline, Tannin, Flavanoid respectively. All the extract have Silica gel as stationary phase. Daruharidra & Pashanbheda have Toluene : ethylacetate: formic acid: methanol (3:3:0.8:0.4) as mobile phase.

Kampilak has Chloroform: ethylacetate (8:2) as mobile phase. Manjistha & Jivanti have Toluene:ethylacetate:formic acid (1:1:0.1) as mobile phase.

Table 4: TLC of ingredients present in Marketed crack cream:-

Drug Extracts	Main constituent	Solvent	Stationary phase	Mobile phase	Detection	No of Spot	Colour of Spots	Rf Values
Daruharidra	Berberin	Methanol	Silica gel	Toluene:ethylacetate:formic acid: methanol (3:3:0.8:0.4)	366nm UV	6 spots	Blue	0.26, 0.31, 0.37, 0.59, 0.69, 0.78
Pashanbheda	Gallic acid	Methanol	Silica gel	Toluene:ethylacetate:formic acid: methanol (3:3:0.8:0.4)	280nm UV	5 spots	Blue	0.89, 0.87, 0.88, 0.86, 0.85
Kampilak	Rottaline	Methanol	Silica gel	Chloroform: ethylacetate (8:2)	Normal light	1 spots	Slight Yellow	0.75
Manjistha	Tannin	Methanol	Silica gel	Toluene:ethylacetate:formic acid (1:1:0.1)	373nm UV	1 spots	Blue	0.35, 0.36, 0.35
Jivanti	Flavanoid	Methanol	Silica gel	Toluene:ethylacetate:formic acid((1:1:0.1)	260nm UV	----	----	-----

As compare to marked formula the main constituents are quantitatively present in more amount than Marked cream by analysing TLC figure.



Extract HC
Jivanti

Extract HC MC
Manjistha

Fig.1. TLC of jivanti & Manjistha

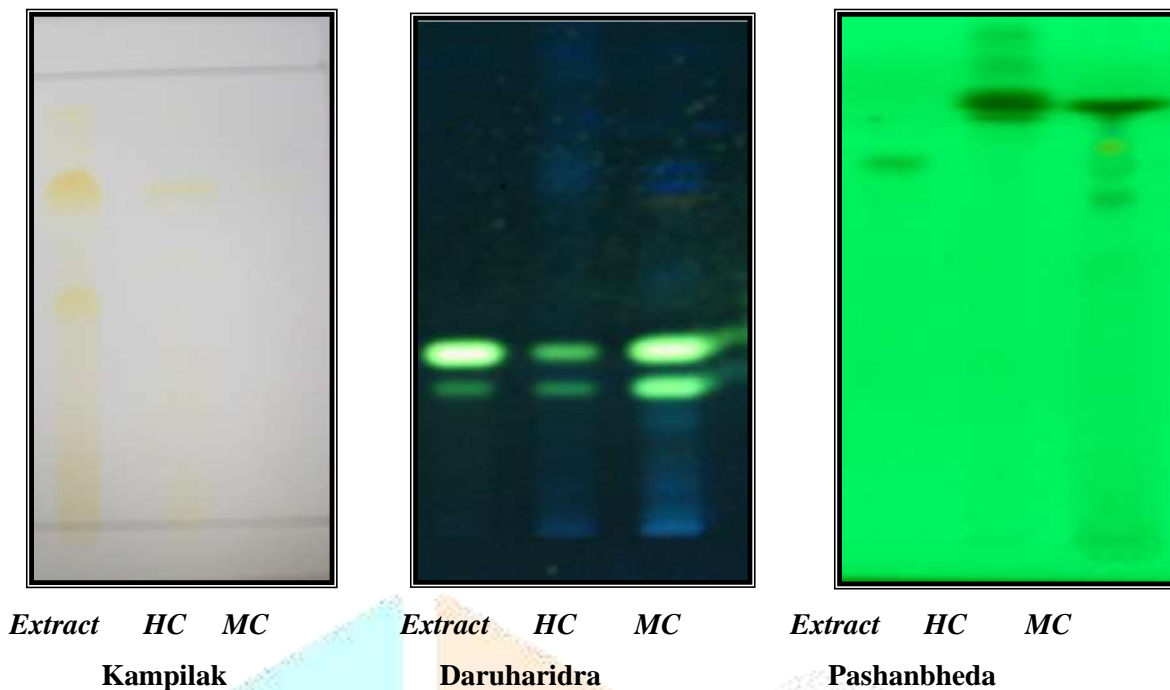


Fig.2. TLC of Kampilak, Daruharidra & Pashanbheda

DISCUSSION:

Herbal crack cream was prepared using general method for preparation of cream and compared with market cream. Herbal crack cream & Market crack cream had Light brown & Greyish yellow colour respectively. Both have Pleasant Odour. Herbal crack cream & Market crack cream had 13.194 & 16.567 P/sec viscosity respectively. Herbal crack cream & Market crack cream had 5.4 & 5.6 PH respectively. Herbal crack cream & Market crack cream had 0.8572 & 0.8661 gm/ml Bulk density. There was absence of hard & Sharped edged particles in both cream, so both had excellent smoothness, Homogeneity, Finess. Herbal crack cream & Market crack cream had very good Palatability, excellent Spreadibility. Herbal crack cream & Market crack cream have Very good & good Squeezing out effect respectively. Both cream are stable at 25 °C, 30 °C, 40 °C, 50 °C (stress study).

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