



FORMULATION AND EVALUATION OF HERBAL CREAM CONTAINING NYCTANTHES ARBORTRISTIS

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ABSTRACT

The aim of this study was formulating and evaluate herbal cosmetic cream for improvement of skin as well as nourishing, moisturizing, lightning. In India, the concept of using herbs for beautification find its origin in tradition medicine literature like Ayurveda. The Herbal cosmetic cream formulation was designed by using extract of Nyctanthes Arbor-tristis (night jasmine) and Myristica fragrans (Nutmeg). Formulated Herbal cream also contain high percentage of vitamin E, it is helpful for treatment of dry skin. evaluation tests were performed to establish the stability of formulated herbal cream. pH of Herbal cream is 6.9 that is not more acidic not more basic. This semisolid cream has good separability. Formulated cream no visible signs of physical instability such as cracking, creaming phase inversion. Investigated herbal cream showed satisfactory organoleptic physicochemical characteristics. The herbal cream is safe to use was proved and it can be used as provision of a barrier to protect skin.

KEYWORDS: Herbal cosmetics, Nyctanthes Arbor-tristis, Myristica fragrans, Vitamin E, pH, organoleptic physicochemical.

INTRODUCTION

The word 'Cosmetic' derived from a Greek word – 'kosmesticos' that means to adorn. From that time any materials used to beautification or promoting appearance is known as cosmetic. The word "cosmetics" actually stems from its use in Ancient Rome. They were typically produced by female slaves known as "cosmetae" which is where the word "cosmetics" stemmed from. Cosmetics are used to enhance appearance. Makeup has been around for many centuries. The first known people who used cosmetics to enhance their beauty were the Egyptians. Makeup those days was just simple eye coloring or some material for the body^{1,2}. Now-a-days makeup plays an important role for both men and women. The importance of cosmetics has increased as many people want to stay young and attractive. Cosmetics are readily available today in the form of creams, lipstick, perfumes, eyeshadows, nail polishes, hair sprays etc. Other cosmetics like face powder give glow to the skin after applying the base cream. Then we have lipsticks, which are applied by many women of all ages. They are made from wax and cocoa butter in the desired amount. Cosmetics like creams, gels, and colognes are used on a daily basis by both women and men. Creams act as a cleanser for the face in many circumstances. More recently anti-ageing creams have been manufactured which can retain younger looking skin for many years. The best cleansing agents are cleansing cream, soap and water. Cosmetic creams serve as a skin food for hard, dry and chapped skin. It mainly lubricates, softens and removes unwanted dirt from the skin. Some popular fat creams that are used include Vaseline and Lanolin. Dry creams are used in the manufacture of soap and gelatin which is used as a base for the skin. The appearance and function of the skin are maintained by an important balance between the water content of the stratum corneum and skin surface lipids^{3,4}. The skin represents the most superficial layer of the body, and so it is constantly exposed to different environmental stimuli. Exposure to external factors as well as endogenous factors may disrupt this balance. In addition, frequent use of soaps, detergents and topical irritants such as alcohol and hot water can remove the skin surface lipids. Disruption of skin barrier led to the various type of skin problems most common condition is a loss of water content which leads to dryness of skin such as roughness, scaling, cracks, redness and an uncomfortable feeling of tightness, sometimes with itching and stinging. Treatment with moisturizer aims at maintaining skin integrity and well-being by providing a healthy appearance of the individual. Numbers of moisturizers are available under the label of natural, safe, organic, herbal while the basic properties of humectancy, occlusivity

and emolliency are consistent across all moisturizers . Most of the available moisturizers use synthetic adhesives, emulsifiers, perfuming agents, pigments, surfactants and thickeners to form the base. There is extensive need to replace toxic synthetic agent from the base using natural agents⁵.

TOPICAL DRUG DELIVERY

Over the last decades the treatment of illness have been accomplished by administrating drugs to human body via various roots namely oral, sublingual ,rectal, parental ,topical ,inhalation etc.Topical delivery can be defined as the application of a drug containing formulation to the skin to directly treat cutaneous disorder or the cutaneous manifestations of a general disease (eg. psoriasis) with the intent of containing the pharmacological or the effect of drug to the surface of the skin or within the skin semisolid formulations in all their diversity dominate the system for topical delivery, but foams, spray , medicated powders, solutions and even medicated adhesive systems are in use⁶.

Advantages of topical drug delivery system

- Avoidance of first pass metabolism.
- Convenient and easy to apply.
- Avoid of risk.
- Inconveniences of intravenous therapy and of the varied conditions of absorption like pH changes presence of enzymes gastric emptying time etc.
- Achievement of efficacy with lower total daily dosage of drug by continuous drug input.
- Avoid fluctuation of drug levels inter and intra patent variations.
- Skin irritation or dermatitis may occur due to the drug or excipients.
- Most drugs have a high molecular weight and are poorly lipid soluble, so are not absorbed via skin or mucous membranes.
- Very slow absorption.

Aim And Objective

Aim – The Aim of The Project Is To Investigate The Formulation And Evaluation Of Herbal Cream Containing Nyctanthes Arbotristis

Objective

The purpose of the present investigation is to formulate and evaluate a herbal skin cream . 2. Herbal plants like Nyctanthes Arbotristis, Nutmeg are used for formulation of herbal skin cream for antispot and moisturising. 3. Then the formulated skin is evaluated for parameters like physical properties, pH , viscosity, spreadability and stability of the formulated cream. 4. The excipient concentrations are varied in order to find out the best formulation with better spreadability, viscosity ,stability etc⁷.

Formulation of the herbal skin cream

- Humectants
- Solvents
- Emollient agents
- Spreading agents
- Gelling agents (Thickening agents)
- Nourishing agent
- Preservatives
- Film formers
- Healing agents
- Antioxidants

Evaluation of cream

- Physical properties
- Rheology test
- Determination of pH
- Spreadability Test
- Peroxide Stability test
- Test for stability

Plant profile and chemicals

Nyctanthes arbor-tristis :



Fig.1: Nyctanthes arbor-tristis tree

Nyctanthes arbor-tristis Linn. (Oleaceae) is popularly known as 'Night Jasmine' or 'Harsinghar' (Hindi) due to the fact that its flowers emit a very strong and pleasant fragrance during the whole night. The flowers start falling after midnight and by the day break, the plant appears dull. The generic name 'Nyctanthus' has been coined from two Greek words 'Nykhta' (Night) and 'anthos' (flower). The specific name 'arbor-tristis' meaning 'the sad tree' is supposedly derived from dull looks of the tree during daytime. It is a terrestrial woody perennial having life span of 5-20 years. The shrub grows to a height of 10 meters. The simple leaves are opposite, with an entire margin about 6-12 cm long and 2 – 6.5cm wide. The flowers are fragrant with a five to eight lobed corolla and orange-red centre, often seen in a cluster of 2 to 7. The fruit is flat, brown and heart-shaped to rounded capsule, around 2cm in diameter with two sections, each containing a single seed^{8,9}.

Nyctanthus is commonly known as :

- a. Night flowering jasmine
- b. Coral jasmine
- c. Parijat in Hindi
- d. Paarijaatham in Telgu
- e. Shephali in Oriya

Taxonomical classification Kingdom

Plantae Division: Magnoliophyta

Class: Magnoliopsida

Order: Lamiales

Family: Oleaceae

Genus: Nyctanthes

Species: arbor-tristis

Binomial name: Nyctanthes arbor-tristis

The plant is named in different vernacular languages.

Unani: Harasingaar.

Sanskrit: Parijatha.

Siddha: Pavazha motif.

Hindi: Harsingar.

Ayurvedic: Paarijaata, Shephaali, Shephaalika, Mandaara.

Chemical constituents of Nyctanthes arbor-tristis Linn

1. Phyto-constituents from leaves

Leaves contain D-mannitol, β -sitosterole, Flavanol glycosides, Astragaline, Nicotiflorin, Oleanolic acid, Nyctanthic acid, Tannic acid, Ascorbic acid, Methyl salicylate, resinous substances, Amorphous glycoside, Amorphous resin, Trace of volatile oil, Carotene, Friedeline, Lupeol, Mannitol, Glucose, Fructose, Iridoid glycosides, Benzoic acid. All the important phytoconstituents are being used in Ayurvedic medication and reported for sciatica, arthritis, fevers, and various painful conditions and as a laxative¹⁰.

2. Phyto-constituents from flowers

Flowers contain modified diterpenoid nyctanthin, flavonoids, anthocyanins and an essential oil which is related to that of jasmine. Flowers have modified essential oil, Nyctanthin, dmannitol, Tannin, Glucose, Carotenoid, Glycosides, β monogentiobioside ester of α -crocetin (or crossing-3), β monogentiobioside, β -D monoglucoside ester of α -Christian, β -digentiobioside ester of α -crocetin (or crossing-1). 1, anthocyanins and essential oil which is similar to jasmine¹⁹Nyctanthin, tannin and glucose, carotenoid, glycosides viz. β monogentiobioside ester of α -crocetin (or crossing-3), β monogentiobioside - β -D monoglucoside ester of α crocetin, β -digentiobioside ester of α -crocetin (or crossing-1), 4- hydroxy hexahydrobenzofuran-7-one also reported in flowers. The orange tubular calyx of the flower contains carotenoids. It also contain an antiplasmodial cyclohexylethanoid, renygolone, a new iridoidglucoside 6-O -trans-cinnamoyl-7- O-acetyl-6- β hydroxyloganin

and three known iridoidglucosides, arborside-C, 6- β -hydroxyloganin and nyctanthoside. Rengyolone was first isolated from Forsythia suspense (Oleaceae), an important plant of the crude drug "rengyo". It was also reported that Halleridone from the African medicinal plant Hallerialucida (Scrophulariaceae) and as a cytotoxic constituent from Cornuscontroversa (cornaceae). It was establish that after several months the mix abused-C has changed in the isomeric structure with the benzene group shifted to C-6-OH. This construction is named as isoarborside-C¹¹.

3. Phyto-constituents from seeds

Seeds contain Arbortristoside A&B, Glycerides of linoleic acid, oleic acid, lignoceric acid, stearic acid, palmitic and myristic acids, nyctanthic acid, 3-4 secotriterpene acid, a water soluble polysaccharide tranquil of D-glucose and D mannose. The seed of Nyctanthes arbortristis contains 15% of pale yellow brown oil, nyctanthic acid, nyctoside A, b-sitosterol, arbortristoside A & B, glycerides of linoleic oleic, lignoceric, stearic, palmitic and myristic acids, 3-4 secotriterpene acid and A water soluble polysaccharide composed of Dglucose and D mammals and used as an immunostimulant and hepatoprotective¹².

4. Phyto-constituents from stem

Stem contain β -sitosterol, Glycoside-naringenin-4-0- β -glucapyranosylaxylopyranoside and Flower oil Flower oil contains p-cymene α -pinene, 1- hexanol methyl heptanone, phenyl acetaldehyde, 1-deconol and anisaldehyde. B-Amyrin, arbortristoside-a, oleanolic acid, nyctoside-a, nyctantic acid and 6- β - hydroxyloganin¹³.

5. Phyto-constituents from the Roots

The root part of the plant composed of alkaloids, tannins and glucosides. From the chloroform extract of the root β -Sitosterol and oleanolic acid has been isolated¹⁴.

Materials And Methods

Chemicals:

Flowers and nutmegs are collected from Ahmednagar region and Other chemicals such as Petroleum jelly , Bicarbonic acid , Rose water , Vitamin E , preservatives, all materials were obtained commercially and used as such.

Table 1: Uses of ingredients

Sr.No	Ingredients	Uses
1	Vitamin E	Protect from uv radiation, antioxidant, antiwrinkle
2	Night jasmine flower	Antioxidants, antihyperlipidemic, antibacterial, antifungal.
3	Nutmeg Flavouring agent	Flavouring agent, carminative, antispot.
4	Petroleum jelly Base	Base, moisturizer .
5	Rose water	Flavouring agent, cooling agent, emollient
6	Fruit vinegar	Antifungal, antibacterial, antioxidant, antiseptic
7	Bicarbonic acid	Maintaining moisture.

Experimental work

Preparation of extract

Night jasmine extraction-Firstly take 5g of accurately weighed night jasmine and dry it. After drying jasmine flower, 0.5g of dried flower is added in 5ml of water and heated on water bath at 100°C up to 2ml extract, filtrate the extract using filter paper. Extract is shown in figure.

Nutmeg extraction

Take a nutmeg, grind it equally, then weigh 0.5g of nutmeg powder accurately. Take that weighed 0.5g nutmeg powder and boil it with 5ml of water-on-water bath at 100°C up to 2ml extract, filtrate the extract using filter paper. Take both extract we have formulated, mix them together and boiled until they get concentrated until 2ml .



Fig.2: Nightjasmine Extract

Formulation and preparation

The emulsifier and oil soluble components (petroleum jelly, vitamin E, fruit vinegar) were dissolved in oil phase and heated upto 80°-100°C and in other which is water soluble compounds (night jasmine extract, nutmeg extract, rose water) were dissolved and heated upto 80-100°C. There are two phases phase A which is oil soluble and phase B which is water soluble. The aqueous phase is slowly added into oil phase with continue stirring in one direction. Stop stirring when it seems to be partly solid.

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Table 2: Composition of cream

Sr.No.	Ingredient	Quantity
1	Vitamin E	1 g
2	Night jasmine flower	0.5 g
3	Nutmeg	0.5 g
4	Petroleum jelly	5 g
5	Rose water	0.5 ml
6	Fruit vinegar	0.5 g
7	Bicarbonic acid	1 g
8	Distilled water	10 ml

Evaluation of cream

Physical properties: Cream was kept under observation for color, odor and appearance.

Table 3: Physical Properties of cream

Sr. No.	Properties	Characteristic
1	Color	Pink
2	Oder	Pleasant
3	Appearance	Semi-Solid

PH of Herbal cream

The pH of prepared cream is 6.9. pH of formulated cream is determined by using pH paper. The pH between 4.5 to 7 suitable for skin. Due to neutral pH, herbal cream has property of anti-irritant and anti-fungal.

Table 4: Thermal stability and pH determination

Sr. No.	Test	Results
1	Thermal stability	Stable no oil separation
2	PH	PH

Patch test

About 1g cream was taken and applied to the sensitive part of skin (behind ear) and spread it. This test had been done in order to determine whether it causes allergic inflammation to the skin, after this test it has been proved safe.

Spreadability test

Cream base should easily spread without dragging much and should not produce greater friction in rubbing process. A special apparatus has been designed to study spreadability of formulation. Spreadability is expressed in second. Spreadability of the herbal cream was measured by 10g of cream on circle of 1.5cm diameter premarket on glass plate for 1min. The diameter of circle after spreading of the cream was determined.

The spreadability was then calculated from the given formula¹⁵,

Spreadability = $m \times l / t$

m = weight tied to upper slide (10gm).

l = length of glass slide (1.5cm).

t= time taken in seconds.

Table 5: Spreadability of cream

Sr. No.	Formulation	Weight tied to upper slide (m)	Length of glass slide moved (l)	Time taken (t)	Spreadability = $m \times l / t$
1	Formula no.1	10g	1.5 ± 0.5cm	30s	0.51g.cm/s

Test for microbial growth in formulated cream

The formulated cream was inoculated on the plates of Muller Hinton agar media by streak plate method and a control was prepared by omitting the cream. The plates were placed in to incubator and incubate at 37°C for 24 hours. After incubation period, plates were taken out and check microbial growth by comparing it with control. Herbal cream has neutral Ph due to this there is no microbial growth in the cream¹⁷.

Determination of homogeneity

The formulation were tested for the homogeneity by visual appearance and touch. Determination of emollience: Emollience, slipperiness and amount of residue left after the application of fixed amount of cream was checked^{18,19,20}.

Result And Discussion

The cream prepared was found to be of pink color and had pleasant odor. Formulated cream was homogenous and smooth and consistent in nature. After many tests this product has been proved safe due to herbal extracts in it and no harmful chemicals used in it as well as it is not synthetic. It has neutral pH so as it matches to the pH of skin. No allergic inflammation noticed during or after testing of this cream. Investigated herbal cream showed satisfactory organoleptic physico-chemical characteristics. It also increases skin moisturization without changing value of skin pH.

Conclusion

The herbal cosmetic products are best option to reduce skin problems like pigmentation, skin wrinkling, skin aging and rough skin texture. The advantages of herbal creams are lower cost, side effect free, environmentally friendly, safe to use. It gives smoothing effect as well as moisturizing effect. It gives fair touch to skin. Herbal cream is designed to improve and maintain the skin barrier function and help to prevent dry skin. It helps in holding on moisture for long time.

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