

# A Review on Polyherbal Anti Ageing Cream Containing Curcumin, Neem Oil and Eucalyptus Oil

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**Abstract:** Herbal formulations have growing demand in the world market and the plants have been reported in the literature having good anti- microbial, anti-oxidant and anti-inflammatory activity. In this study cream was formulated based on the anti-oxidant potential of herbal extracts and its evaluation. As earlier studies has stated neem, curcumin is having rich antioxidant property. The present study is based on combining the antioxidant capacity of neem, curcumin with eucalyptus oil and other herbs to obtain enhanced antioxidant property which can be used to treat the emerging problems of ageing at early age in youth due to exposure to sunlight, pollutants and many other factors. The present research aims at formulating and evaluating polyherbal antiwrinkle face cream.

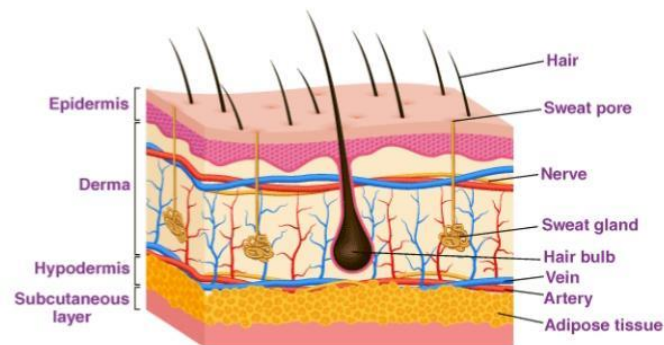
**Keywords:** Neem, Curcumin, Eucalyptus oil

## I. 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.[1] 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. Topical Drug Delivery Topical drug delivery system is a route of administration of drugs via the skin to provide topical therapeutic effects.

### Advantages of topical drug delivery system :-

- Avoidance of first pass metabolism.
- Convenient and easy to apply
- Avoid of risk
- 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.
- Physiology of human skin
- 1) Epidermis 2) Dermis 3) Subcutaneous gland



**Functions of skin Skin performs the following functions:**

- Protection
- Sensation
- Heat regulation
- Control of evaporation
- Aesthetics and communication
- Storage and synthesis
- Water resistance

**Antiageing Creams**

The meaning of Anti-aging is intended to reduce the appearance of wrinkles in the skin. Benefits of Antiageing Creams Skin Tightening And Hydration, Gain Skin Radiance, Increases Your Self-Confidence, Positive Effect On Your Health, Prevents The Occurrence of Age Spots and Discoloration, Anti-Aging Cream keeps wrinkles at bay and adds a natural glow to your skin, and reduces fine lines.

Herbs chosen for preparation of antiageing cream

- 1) Curcuma longa
- 2) Neem oil
- 3) Eucalyptus oil

**Aim :** To formulate and evaluate polyherbal antiageing cream.

**Objectives:**

The main objectives of this work to evaluate Antioxidants activity by performing comparative evaluation of various fractions of Curcuma longa, neem oil and eucalyptus with the help of the Quantitative & Qualitative determination and then explaining enhanced Antiageing property of polyherbs on skin.

To collect parts of selected plant from different regions.

To study extraction of phytochemicals.

Preliminary phytochemical screening of all three extracts.

To understand formulation of cream.

To study the different evaluation parameter of cream.

To study antioxidant activity of selected parts of plants.

Eucalyptus globulus Labill.

Common Name- (Tasmanian blue gum), Nilgiri

Family – Myrtaceae

**Plant profile**

**1) Eucalyptus globulus**

commonly known as southern blue gum or blue gum, is a species of tall, evergreen tree endemic to southeastern Australia. This Eucalyptus species has mostly smooth bark, juvenile leaves that are whitish and waxy on the lower surface, glossy green, lance shaped adult leaves, glaucous, ribbed flower buds arranged singly or in groups of three or seven in leaf axils, white flowers and woody fruit.

Phytoconstituents –

The Eucalyptus oil is a complex mixture of a variety of monoterpenes and sesquiterpenes, and aromatic phenols, oxides, ethers, alcohols, esters, aldehydes and ketones such as 1,8-cineole (Eucalyptol), citronellal, citronellol, citronellyl acetate, p-cymene, eucamalol, limonene, linalool,  $\alpha$ -pinene,  $\gamma$ -terpinene, etc.

**Taxonomical Classification**

RANK	SCIENTIFIC NAME AND COMMON NAME
Kingdom	<i>Plantae</i> - Plants
Subkingdom	<i>Tracheobionta</i> - Vascular plants
Superdivision	<i>Spermatophyta</i> - Seed plants
Division	<i>Magnoliophyta</i> - Flowering plants
Class	<i>Magnoliopsida</i> - Dicotyledons
Subclass	<i>Rosidae</i>
Order	<i>Myrtales</i>
Family	<i>Myrtaceae</i> Juss. - Myrtle family
Genus	<i>Eucalyptus</i> L'Hér. - gum
Species	<i>Eucalyptus globulus</i> Labill. - Tasmanian bluegum

2) *Curcuma longa*

Common Name- Indian saffron, Turmeric, Haldi

Family- Zingiberacea

Rank	Scientific Name and Common Name
Kingdom	<i>Plantae</i> - Plants
Subkingdom	<i>Tracheobionta</i> - Vascular plants
Superdivision	<i>Spermatophyta</i> - Seed plants
Division	<i>Magnoliophyta</i> - Flowering plants
Class	<i>Liliopsida</i> - Monocotyledons
Subclass	<i>Zingiberidae</i>
Order	<i>Zingiberales</i>
Family	<i>Zingiberaceae</i> Martinov - Ginger family
Genus	<i>Curcuma</i> L. - curcuma
Species	<i>Curcuma longa</i> L. - common turmeric

Turmeric is regarded as the golden spice with innumerable health benefits. Turmeric, scientifically known as *Curcuma longa* belongs to the Zingiberaceae family, genus *Curcuma*. The crop is cultivated in the tropical and subtropical regions around the world . Turmeric originates from the Indian subcontinent and South East Asian countries.

Phytoconstituents- Turmeric powder is about 60–70% carbohydrates, 6–13% water, 6–8% protein, 5–10% fat, 3–7% dietary minerals, 3–7% essential oils, 2–7% dietary fiber, and 1–6% curcuminoids. The golden yellow color of turmeric is due to curcumin.

3) **Neem oil**

Common Name- *Azadirachta indica*

Family- Meliaceae

RANK	SCIENTIFIC NAME AND COMMON NAME
Kingdom	<i>Plantae</i> - Plants
Subkingdom	<i>Tracheobionta</i> - Vascular plants
Superdivision	<i>Spermatophyta</i> - Seed plants
Division	<i>Magnoliophyta</i> - Flowering plants
Class	<i>Magnoliopsida</i> - Dicotyledons
Subclass	<i>Rosidae</i>
Order	<i>Sapindales</i>
Family	<i>Meliaceae</i> Juss. - Mahogany family

Neem oil is a vegetable oil obtained from the seed kernels of Neem tree (*Azadirachta indica*), an evergreen of the tropics and sub-tropics. It is deep yellow in color and has garlic-like odor. It contains active ingredients like azadirachtin, nimbin, picrin, and sialin.

**Role of key ingredients**

**Formulation table**

INGREDIENTS	CATEGORY
Neem Oil	API
Eucalyptus Oil	API
Curcuma Longa Extract	API
Bee Wax	Base
Propylene Glycol	Binder and Moisturizer
Borax	Preservative
Methyl Paraben	Preservative
Almond oil	Base
Rose oil	Flavoring agent
Vitamin E capsule	Antioxidant

Ingredient	Quantity	Role
Curcumin	1.5	Anti-oxidant
Eucalptus oil	1.5	Anti-oxidant
Neem oil	1.5	Anti-oxidant
Bees wax	8	Thickening agent
Borax	1.47	Preservative
LiquidParaffin	22.5	Lubricant
Propyl Paraben	0.03	Preservative
Rose Water	qs	Flavouring agent
Distilled water	qs	Diluent

**Methods of preparation**

Melting beeswax, liquid paraffin, and propyl paraben, produced the oily phase. Next, borax were dissolved in water at 75 degree Celsius to create the aqueous phase. After continuously stirring the addition of the aqueous phase to the oil phase and adding the necessary amounts of API, the formulation allow to cool.

**Preliminary test for Phytochemical analysis**

**1) Phytochemical Analysis of Turmeric-**

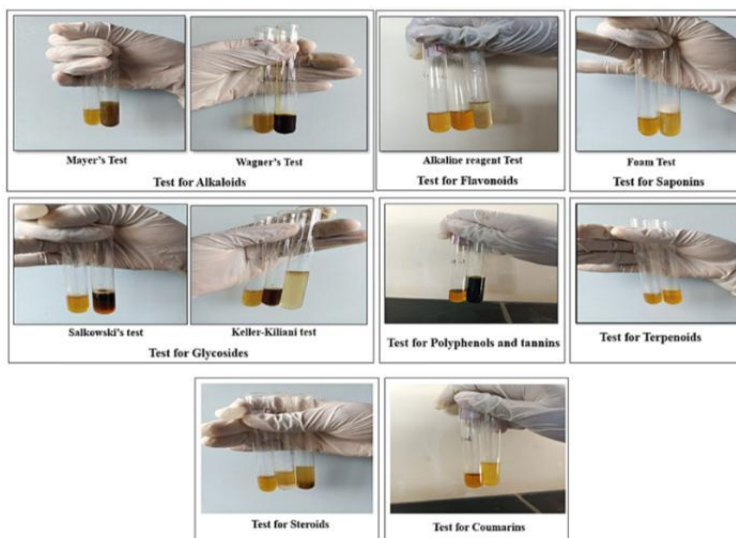


- (A) The presence of green colour confirmed the positive test for carbohydrates in aqueous extract of turmeric,
- (B) The absence of yellow colour confirmed the negative test for proteins in aqueous extract of turmeric,
- (C) The presence of intense yellow colour confirmed the positive test for flavonoids in aqueous extract of turmeric,
- (D) The absence of blue violet colour confirmed the negative test for anthocyanin's in aqueous extract of turmeric,

- (E) The absence of upper red layer confirmed the negative test for leuco-anthocyanins in aqueous extract of turmeric.
- (F) The presence of yellow colour confirmed the positive test for coumarins in aqueous extract of turmeric,
- (G) The presence of upper red layer and a lower greenish layer confirmed the positive test for steroids in aqueous extract of turmeric,
- (H) The presence of persistent foam confirmed the positive test for saponins in aqueous extract of turmeric,
- (I) The occurrence of yellow precipitates confirmed the positive test for tannins in aqueous extract of turmeric,
- (J) The presence of blackish colour confirmed the positive test for phenols in aqueous extract of turmeric.

**2) Phytochemical analysis of neem oil**

- 1.test for Alkaloid
  - a.mayers test
  - b.wagers test
- 2.Test for flavonoids
- 3.Test for glycosides
- 4.Test for tannin
- 5.Test for terpenoids
- 6.Test for steroids
- 7.. Test for coumarin



**3) Phytochemical analysis of Eucalyptus oil**

- 1) Foam test: Two ml of extract was dissolved in 3 ml distilled water and shaken vigorously. A stable top layer of foam was formed, indicating the presence of saponins in the sample.
- 2) Hansch test: Two ml of extract was taken in a test tube. One ml of concentrated H<sub>2</sub>SO<sub>4</sub> was added from the side walls of the test tube and the formation of a brown ring suggested the presence of carbohydrates.
- 3) Tannin test: To 0.5 ml of extract solution one ml of water and 1-2 drops of ferric chloride solution was added. Blue color was observed for gallic tannins and green black for catecholic tannins.
- 4) Flavonoid test: Two ml of filtrate was taken. Five to six drops of concentrated HCl and a few magnesium filings were added to it. Appearance of red color indicates the presence of flavonoids.
- 5) Phenol test: In two ml of extract, a pinch of ferric chloride was added. Appearance of green color indicates the presence phenol.

### **Evaluation test for cream**

#### 1. Organoleptic evaluation

The cream thus obtained was evaluated for its organoleptic properties like color, odour, and state. The appearance of the cream was judged by its color and roughness and graded. Results are listed

#### 2. Test for microbial growth

The formulated creams were 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 the incubator and are incubated at 37°C for 24 hours. After the incubation period, plates were taken out and check the microbial growth by comparing it with the control. Results are listed in Table 3.

#### 3. Stability studies

Stability testing of drug products begins as a part of drug discovery and ends with the demise of the compound or commercial product. To assess the drug and formulation stability, stability studies were done according to ICH guidelines. The stability studies were carried out as per ICH guidelines. The cream filled in bottle and kept in humidity chamber maintained at  $30 \pm 2$  °C /  $65 \pm 5$  % RH and  $40 \pm 2$  °C /  $75 \pm 5$  % RH for two months. At the end of studies, samples were analyzed for the physical properties and viscosity.

#### 4. pH

The pH meter was calibrated using standard buffer solution. About 0.5 g of the cream was weighed and dissolved in 50.0 ml of distilled water and its pH was measured.

#### 5. Spreadability studies

An important criteria for semisolids is that it posses good spreadability. Spreadability is a term expressed to denote the extent of area to which the cream readily spreads on application to the skin. The therapeutic efficacy of a formulation also depends on its spreading value. A special apparatus has been designed to study the spreadability of the formulations. Spreadability is expressed in terms of time in seconds taken by two slides to slip off from the formulation, placed between, under the application of a certain load. Lesser the time taken for the separation of the two, better the spreadability. Two glass slides of standard dimensions were selected. The formulation whose spreadability had to determined was placed over one of the slides. slides across the length of 5 cm along the slide. 100 g weight was placed up on the upper slide so that the formulation between the two slides was pressed uniformly to form a thin layer. The weight was removed and the excess of formulation adhering to the slides was scrapped off. One of the slides was fixed on which the formulation was placed. The second movable slide was placed over it, with one end tied to a string to which load could be applied by the help of a simple pulley and a pan. A 30g weight was put on the pan and the time taken for the upper slide to travel the distance of 5.0cm and separate away from the lower slide under the direction of the weight was noted. The spreadability was then calculated from the following formula:  $\text{Spreadability} = m \times l / T$  m = weight tied to the upper slide (30g) l =length of glass slide (5cm) t =time taken in seconds. The

#### 6. Viscosity

Viscosity of the formulation was determined by Brookfield Viscometer. The viscosity measurements were done using Brookfield DV-II + viscometer using LV-4 spindle. The developed formulation was poured into the adaptor of the viscometer and the angular viscosity increased gradually from 0.5 to 20 rpm.

#### Irritancy test

Mark an area (1sq.cm) on the left hand dorsal surface. The cream was applied to the specified area and time was noted. Irritancy, erythematic, edema, was checked if any for regular intervals up to 24 hrs and reported.

#### Homogeneity

All formulations produce uniform distribution of extracts in cream. This was confirmed by visual appearance and by touch.

## **II. CONCLUSION**

From above results it is concluded that on combining the extracts of curcumin, Eucalyptus oil and neem oil different components in different ratio to get multipurpose effect such as whitening, antiwrinkle, antiaging and sunscreen effect on skin. As we know that it is not possible to increase the extent of efficiency of medicinal and cosmetic

property of single plant extract, but by combining the different natural components can be possible to increase the efficacy of extracts. In this regard, we mixed the extracts of curcumin, neem oil, Eucalyptus oil to improve as well synergize the cosmetic properties of prepared products compare to individual extracts. Further research will carry out to check scientifically the synergistic action of selected formulation.

#### REFERENCES

- [1]. Kaur IP, Kapila M, Agrawal R. Role of novel delivery systems in developing topical antioxidants as therapeutics to combat photo aging, 6, 2007, 271-288.
- [2]. Watson, Ogden S, Cotterell LF, Bowden JJ, Bastrilles JY, Long SP, Griffiths CE. A cosmetic 'anti-ageing' product improves photo aged skin, a doubleblind, randomized controlled trial British. J Dermatol, 161, 2009, 419-426.
- [3]. S. Saraf, C.D. Kaur, Phytoconstituents as photoprotective novel cosmetic formulations, Pharmacogn. Rev., 4(7), 2010, 1-11.
- [4]. Hema Sharma Datta and Rangesh Paramesh, Trends in aging and skin care: Ayurvedic concepts, Journal of Ayurveda and Integrative Medicine, 1(2), 2010, 110-113.
- [5]. Geesin JC, Darr D, Kaufmann R, Murad S and Pinnel SR, Ascorbic acid especially increases type I and type III procollagen messenger RNA levels in human skin fibroblast. J. Invest. Dermatol., 90(4), 1998, 420-444
- [6]. A.K. Mishra, A. Mishra, P. Chattopadhyay, Herbal Cosmeceuticals for Photoprotection from Ultraviolet B Radiation, A Review, T.J.P.R., 10(3), 2011, 351-360.
- [7]. Eichler O, Sies H, Stahl W, Divergent optimum levels of lycopene, beta-carotene and lutein protecting against UVB irradiation in human fibroblasts. Photochem. Photobiol, 75, 2002, 503-506.
- [8]. Wrona M, Korytowski W, Róanowska M, Sarna T, Truscott TG, Cooperation of antioxidants in protection against photosensitized oxidation. Free Radic. Biol. Med., 25(10), 2003, 1319-1329.
- [9]. Prieto P., Pineda M. and Aguilar M., Spectrophotometric quantitation of antioxidant capacity through the formation of a phosphomolybdenum complex: specific application to the determination of vitamin E, Anal. Biochem., 269, 1999, 337-341.
- [10]. Anila L, Vijayalakshmi NR. Antioxidant Action of flavonoids from *Mangifera indica* And *Embolia officinalis* in Hypercholesterolemic rats. Food Chem., 2003; 83:569-574.
- [11]. Mishra AK, Mishra A, Chattopadhyay P. Herbal Cosmeceuticals for Photoprotection From Ultraviolet B Radiation, A Review, T.J.P.R., 2011; 10(3):351-360.
- [12]. Ashish Aswal, Mohini Kalra and Abhiram Rout: Preparation and evaluation of Polyherbal cosmetic cream. Der Pharmacia Lettre, 2015(1):83-88.
- [13]. U.S. National Plant Germplasm System. *Carica papaya* L. <https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?9147>
- [14]. Lim T (2012) Edible medicinal and non-Medicinal plants. Vol. 1. Fruits. New York, Dordrecht, Netherlands: Springer, pp 693-714.
- [15]. United States Department of Agriculture Agricultural Research Service National Nutrient Database for Standard Reference Legacy Release <https://ndb.nal.usda.gov/ndb/foods/show/09226?fgcd=&manu=&format=&count=&ax=25&offset=&sort=default&order=asc&qlookUp=Papayas%2C+raw&ds=&qt=&qp=&qa=&qn=&q=&ing=>
- [16]. Asghar N, Naqvi SA, Hussain Z et al (2016) Compositional difference in antioxidant and Antibacterial activity of all parts of the *Carica Papaya* using different solvents. Chem Cent J 10:5. Doi: 10.1186/s13065-016-0149-0.