

# Formulation and Evaluation of Polyherbal Cream for Skin Revitalization

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## ABSTRACT

Herbal cosmetics are referred to as products, formulated using various permissible cosmetic ingredients to form the base in which one or more herbal ingredients are used to provide defined cosmetic benefits only. This Polyherbal cream provides the benefits of skin revitalization. The skin is the body's first line of defense against physical damage. Skin revitalization involves cosmetic treatments that cause the skin to appear more youthful. It helps to make the skin look and feel younger by improving the natural glow of the skin. The main purpose of this polyherbal cream is to provide the anti-aging effect by utilizing the antioxidant activity. Aging is ultimately a combination of physiological changes in our bodies and the environmental factors we are exposed to. Studies concerning skin aging stated that acute exposure of human skin to Ultraviolet Radiation (UVR) causes the oxidation of cellular biomolecules, that occurs due to the free radicals, which is responsible for the breakdown of collagen and inhibition of new collagen synthesis, that results in unflattering skin blemishes like wrinkles, dark spots, fine lines, loose, saggy skin. Skin aging is a complex, progressive, time-dependent deterioration caused by intrinsic and extrinsic factors or environmental factors. Skin is equipped with an elaborate antioxidant system that protects it from oxidative damage due to intrinsic and extrinsic factors. To overcome the problem of skin ageing many medicinal plants have been extensively studied as alternative treatment for diseases and many formulations are available in market. For that *Vitis vinifera* (Grape) and *Daucus carota* (Carrot) were selected for polyherbal formulation. Aqueous extracts of both the plants were prepared. Antioxidant activity was studied for both extracts by Hydrogen peroxide scavenging activity. Polyherbal cream formulation were prepared using different combination of extracts and physical evaluation parameters like pH, Spreadability were studied. Samples of *Vitis vinifera* & *Daucus carota* inhibited the production of hydroxyl radical by showing strong scavenging activity. Since the formulation showed strong scavenging activity, it can be said that it will give an effective anti-aging effect.

**Keywords:** *Vitis vinifera*, *Daucus carota*, Aging, Anti-oxidant activity, Cream.

## CHAPTER 1

### 1. INTRODUCTION

#### 1.1 COSMETICS

##### Definition:

As per section 3 of the drugs and cosmetics act 1940, and rules 1945, Cosmetic means any article intended to be rubbed, poured, sprinkled or sprayed on, or introduced into or otherwise applied to, the human body

or any part of body for cleansing, beautifying, promoting attractiveness or altering the appearance and includes any article intended for use as a component of cosmetic.

**History:**

The word cosmetic was derived from the Greek word ‘kosm tikos’ meaning have the power to arrange, skill in decorating. The Egyptians were the first to recognize the health properties of the cosmetics. Up to the 19th century, there was no clear distinction between cosmetics and pharmaceuticals; the separation occurred when the first modern pharmaceutical industry was developed. Cosmeceuticals rapidly expanded in 1980s due to hydroxy acids (natural fruit acids) used as exfoliants against wrinkles. Raymond Reed, founding member of the United States Society of Cosmetic Chemists, coined the term ‘Cosmeceutical’ in 1961. In 1971, Albert Klingman Reactivated interest in cosmeceuticals by developing a formula to improve appearance of UV damaged and wrinkled skin, using retinoic acid. They are applied topically as cosmetics but contain ingredients that influence the skin’s biological function.

**1.2 HERBAL COSMETICS:****Definition:**

Herbal cosmetics are referred to as products, formulated using various permissible cosmetic ingredients to form the base in which one or more herbal ingredients are used to provide defined cosmetic benefits only.

**History:**

The cosmeceutical approach towards health and beauty dates back, to centuries where vaidyas were practicing integrated holistic health and incorporating botanicals, oils and massage into whole body. In ancient Greece and Rome, countless ointments and tonics were recommended for beautification of hair, skin as well as remedies for the treatment of scalp and skin diseases. Recently herbal cosmeceuticals have gained much recognition and become popular among Indian people as well as abroad.

**Categories:****Table 1.1 Plants with Anti-aging Properties:-**

Name of plant	Active constituent
Crataevea murula	Lupenol
Rosemarius officinalis	Rosemary

**Table 1.2 Plants with Anti-oxidant Properties:-**

Name of plant	Active constituent
Areca catechu	Catechin
Allium sativum	Alliin and Allicin

**1.3 HOW TO USE HERBS IN COSMETICS:**

Herbal drug or herbs were used for both medicinal purposes as well as for beautification. They have been used in fresh form and dried form. These can be used by making some preparation or directly applying to the body with or without using other ingredients. In fact, in earlier time these were used this way but now a day their extract decoction, infusion, tinctures, steam distillates etc. are used rather than herbs themselves. Whenever these are prepared preservatives should be added to them as these are perishable.

**1.3.1 Infusion**

Infusion is basically strong teas and can be prepared either in China clay pots or stainlesssteel vessel. Alu-

minimum vessel should not be used as these contaminate the infusion.

### 1.3.2 Decoction

Decoction is prepared by boiling the herb with water.

### 1.3.3 Flower Water

Flower water made in the same way as infusion. The same preparation of herbs and water can be used. However, the difference in infusion and flowers water in that solvent is allowed to remain in contact with flowers overnight in case of flower water. Flower water can also be prepared by using essential oil and purified water.

### 1.3.4 Oil Soluble Extract

Oil soluble extract is prepared by extracting herbs with petroleum ether. The herb is left in contact with water overnight. Water mixture in a vessel containing oil and the vessel is heated till all the water has been removed. Allow the oil to cool and is then filtered. In this way oil soluble principle of herb goes into oil.

### 1.3.5 Phytoconstituents used in cosmetic preparation

**Retinoic Acid:** Naturally occurring form of vitamin A. Vitamin A is known as retinoic acid which is very commonly used topically for treatment of photoaged (sun-damage) and also for acne i.e., skin eruption with red pimples. Retinoic acid is said to increase the rate of cell division and turn over. It is also useful in reducing the wrinkles, hyperpigmentation and roughness due to over exposure to sunlight.

**Alpha Hydroxy acid:** Glycolic acid and lactic acid are the commonly used alpha hydroxy acid in cosmeceutical formulations. These weaken the linkage of cell in dry skin and favor its exfoliation. The flexibility of skin is increased due to topical application. Aleuritic acid from shellac is now a day preferred as substitute for alpha-hydroxy acid.

**Vitamins (Vitamin – C and E):** A well antioxidant vitamin C from amla tremendously used in cosmetics. It is described to be the scavenger of oxygen free radicals which are responsible for aging process of skin. Exposure of the skin to UV light induces the formation of free radicals causing the skin to age rapidly. Vitamin C has synergistic effect with vitamin E and used as protective against UV radiation.

## 1.4 AGING:

### 1.4.1 Definition

Aging is ultimately a combination of physiological changes in our bodies and the environmental factors we are exposed to.

### 1.4.2 Types of Aging

**Intrinsic aging:** Intrinsic aging is genetic or chronological aging. It means we are genetically programmed from birth to age a certain way, and we can't change it. This is about 10% of the aging process and starts to show up around age 60. The processes within skin that change with intrinsic aging include a slowing of collagen and elastin production, decreased cellular regeneration, loss underlying fat and the slowing of exfoliation. The signs of intrinsic aging are the following: wrinkles, sagging skin and the weakening of bones.<sup>7</sup> **Extrinsic aging:** Extrinsic aging is environmental or lifestyle aging. This is about 90% of the aging process and starts to show around age 30. It is caused by factors like, sun exposure, lifestyle habits, smoking and repeated facial expressions. Sun exposure is the number one contributor to extrinsic aging and is known as photoaging. Sun exposure can lead to wrinkles, loose skin, age spots, spider veins on the face, freckles, rough and leathery skin and skin cancer. Repeated ultraviolet exposure breaks down collagen and elastin and slows the production of new collagen. The rate at which photoaging affects you depends on your skin color and the amount of time spent in the sun over your lifetime.

### 1.4.3 Theories of Aging

Many theories have been proposed to explain the process of aging. Modern Biological theories of aging in humans fall into two categories: programmed and damage or error theories. The programmed theories imply that aging follows a biological timetable, perhaps a continuation of the one that regulates childhood growth and development. This regulation would depend on changes in gene expression that affect the systems responsible for maintenance, repair and defense responses. The damage or error theories emphasize environmental assaults to living organisms that induce cumulative damage at various levels as the cause of aging.

The programmed theory has three sub-categories:

1. Programmed Longevity: Aging is the result of a sequential switching on and off of certain genes, with senescence being defined as the time when age-associated deficits are manifested. Dr. Davidovic et al discuss the role of genetic instability in aging and dynamics of the aging process.
2. Endocrine Theory: Biological clocks act through hormones to control the pace of aging. Recent studies confirm that aging is hormonally regulated and that the evolutionarily conserved insulin/IGF-1 signaling (IIS) pathway plays a key role in the hormonal regulation of aging. Dr. van Heemst discusses the potential mechanism underlying IIS and aging process.
3. Immunological Theory: The immune system is programmed to decline over time, which leads to an increased vulnerability to infectious disease and thus aging and death. It is well documented that the effectiveness of the immune system peaks at puberty and gradually declines thereafter with advance in age. For example, as one grows older, antibodies lose their effectiveness, and fewer new diseases can be combated effectively by the body, which causes cellular stress and eventual death. Indeed, dysregulated immune response has been linked to cardiovascular disease, inflammation, Alzheimer's disease (AD), and cancer. Although direct causal relationships have not been established for all these detrimental outcomes, the immune system has been at least indirectly implicated.



**Figure 1.1 Pictures showing aging of skin**

### 1.5 BENEFITS OF HERBAL COSMETICS:-

- They do not provoke allergic reaction and do not have negative side effects.
- They are easily incorporated with skin and hair.
- With small quantity they are very effective as compared to synthetic cosmetics.
- Extracts of plant decrease the bulk property of cosmetics and give appropriate pharmacological effects.
- Easily available and found in large variety and quantity.
- Easy to manufacture and cheap in cost.

## 1.6 CREAMS:

### 1.6.1 Definition

Creams are defined as “viscous liquid or semi-solid emulsions of either the oil-in-water or water-in-oil type” dosage forms which consistency varies by oil and water. Creams are used for cosmetic purposes such as cleansing, beautifying, improving appearances, protective or for therapeutic function. These topical formulations are used for the localized effect for the delivery of the drug into the underlying layer of the skin or the mucous membrane.

### 1.6.2 Types of Cream

Oil-in-water (O/W) creams which are composed of small droplets of oil dispersed in a continuous water phase, and water-in-oil (W/O) creams which are composed of small droplets of water dispersed in a continuous oily phase. Oil-in-water creams are more comfortable and cosmetically acceptable as they are less greasy and more easily washed off using water.

Water-in-oil creams are more difficult to handle but many drugs which are incorporated into creams are hydrophobic and will be released more readily from a water-in-oil cream than an oil-in-water cream. Water-in-oil creams are also more moisturising as they provide an oily barrier which reduces water loss from the stratum corneum, the outermost layer of the skin.

### 1.6.3 Classification of Creams:

All the skin creams can be classified on different basis:

1. According to function, e.g., cleansing, foundation, massage, etc.
2. According to characteristics properties, e.g., cold creams, vanishing creams, etc.
3. According to the nature or type of emulsion.

Types of creams according to function, characteristic properties and type of emulsion:

1. Make-up cream (o/w emulsion): a) Vanishing creams. b) Foundation creams.
2. Cleansing cream, cleansing milk, cleansing lotion (w/o emulsion)
3. Winter cream (w/o emulsion): a) Cold cream or moisturizing creams.
4. All-purpose cream and general creams.
5. Night cream and massage creams.
6. Skin protective cream.
7. Hand and body creams.

1. **Make-up cream:** These are mainly o/w type of emulsion. It is cream-based product which leaves a smooth hydrated finish (either stain matte or luminous) on the skin. It nourishes skin and is basically sweat-resistant and creates a dewy sheen.
2. **Vanishing Creams:** They are called vanishing creams because they seem to disappear when rubbed onto the skin. These formulations are based on stearic acid. After application, the cream leaves a dry but tacky residual film which also has a drying effect on the skin. Because of this reason, these are used particularly in hot climates which cause perspiration on the skin.<sup>25</sup>
3. **Foundation Creams:** These creams serve as a foundation base for make-up. It acts as an adherent base for application of make-up powders. They provide emollient action and a protective action against environment to the skin which is neither too greasy nor too dry. It is multi-colored make up applied on the face to create an even, uniform color similar to the complexion, to cover flaws and to change the skin tones.
4. **Cleansing Creams:** These creams are used for body cleaning purposes and it is used for personal hygiene and beautification which is important for cosmetics. Cleansing creams or lotions can be used

for the removal of make-up, surface grim, oil mainly from the face and neck.

5. **Winter creams:** These are w/o type of formulation and in this formulation oil content will be more than water content. These creams are mainly used for chapped and dry skin. Cold cream: It is known as moisturizer or moisturizing cream. Cold cream must have an emollient action. It should produce a cooling sensation in use and the oil film on the skin should be non-occlusive.
6. **All-purpose creams and general creams:** These creams are used more nowadays than before. These creams are somewhat oily but non-greasy type and can spread on the skin easily. This can also be used as a night cream, nourishing creams, protective creams for prevention or alleviation of sunburns or for the treatment of roughened skin areas.
7. **Night creams or massage creams:** These creams are mainly used for the nourishing the skin or as a treatment to dry skin. Creams which are generally applied on skin and left for few or several hours over night are mainly known as night creams. Creams which act as an emollient by rubbing the cream on the skin with massage is known as massage cream.
8. **Skin Protective creams:** These creams are smooth, thick bodied creams formulated to provide an invisible, uniform protective film barrier to the skin. It helps to maintain the barrier between the skin and contaminants that may irritate the skin (contact dermatitis and occupational dermatitis). Strengthens the natural properties of the skin and maintains the balance of normal to combination skin.
9. **Hand and body creams:** Hands are one of the first places to show signs of aging. We tend to wash our hand several times a day, stripping off moisture. Applying cream softens and protects the skin and it keeps the skin looks younger. Since the skin on our palms and fingers needs oil to stay supple and to prevent it from chapping and cracking, it is sensible to use hand creams that puts plenty of oil back in. It is used on the hands more than other parts of the body.

#### 1.6.4 General Ingredients in Creams:-

1. **Water:** This is the most important and widely used raw material in any cream formulation. These are the cheapest and easily available. In skin creams, water is used as solvent to dissolve other ingredients of creams. Water, which is free of any toxins, pollutants, microbes, etc. is used in preparation of creams. Water can also form emulsions; it depends upon how much quantity of water is used in the formulation and sometimes referred to as oil-in-water emulsions and sometimes water-in-oil emulsions depending upon the quantities of oil phase and water phase used.
2. **Oil, fates and waxes:** Oil, fats and waxes and derivatives their form comprises an essential portion of creams. Waxes act as an emulsifier, fats act as a thickener and oil act as a perfuming agent, preservative, etc. according to its function. Oil may be two types' mineral and glyceride.
3. **Mineral oil:** Mineral oil consists of hydrocarbons derived from petroleum oil. Mineral oil is clear, doorless, and heavily refined oil and it is widely used in cosmetics. Mineral oil rarely causes allergic reactions and it cannot become solid and clog pores of the skin. It is light weight and inexpensive, it helps to reduce water loss from the body and keeps body moisturized. A number of mineral oils are used in cream formulation. Examples: Light liquid paraffin, Heavy liquid paraffin, Liquid petroleum.
4. **Glyceride oil:** Glyceride oil is mostly vegetable oils. Examples of glyceride oils are almond oil, arachis oil, castor oil, coconut oil, olive oil etc.
5. **Vegetable oil:** Form a barrier on the surface of the skin and slow down the loss of water, helping to maintain plumpness of skin. Vegetable oils may also be used to increase the thickness of the lipid or oil portion of cream or personal care products. Almond oil, germ oil, avocado oil, sunflower oil etc.

6. **Waxes:** Which are used in preparation of cream includes beeswax, carnauba wax, ceresin, spermaceti, etc. Waxes are used in cosmetics because it helps to keep an emulsion from separation of oil and liquid components. These waxes also increase the thickness of the lipid portion and sticks on the surface of the skin.
7. **Fats:** Different types of fats are used in the preparation of creams. These materials can be obtained from animals, plants or mineral origin. Glyceride oils and fats may be of animals or vegetable origin. They consist of combinations of higher fatty acids and glycerine. When saponified they form soap, or fatty acid and glycerine, depending upon process used. The most common of these fatty acids are lauric, margaric, palmitic, stearic, saturated group. Oleic acid is liquid and most popular unsaturated fatty acid. More specially the oil most commonly used in other cosmetics are olive oil, almond oil, sesame oil, peanut oil, cocoa butter fat, mutton tallow, lard and beef stearin.
8. **Lanolin:** It is derived from wool fat of a sheep. Lanolin is of two types- the hydrous lanolin contains between 25%- 30% water. Anhydrous lanolin has point of 38°C-42°C and has a slight odor. These ingredients act as a lubricant on the skin surface, which gives the skin soft and smooth appearance. Lanolin helps to form emulsion and blends well with other substances used in cosmetic and personal care products. Colors: Before the development of the modern technology, colors primarily came from substances found in nature such as turmeric, saffron, indigo, etc. After the 19th century, colors were made in the laboratory and were found to be much more stable with greater coloring intensity. They also could be produced without using plants harvested in the wild.
9. **Emollients:** Emollients, also commonly referred to as moisturizers, are products that help to soften skin or to treat skin that has become dry. Most emollients are forms of oil or grease, such as mineral oil, squalene, and lanolin. They work by increasing the ability of the skin to hold water, providing the skin with a layer of oil to prevent water loss, and lubricating the skin.
10. **Humectants:** These are important multi-functional ingredients found in most skin care formulations. Humectants are hygroscopic organic compounds. These are the materials that can absorb or retain moisture. These has many benefits such as moisturization, exfoliation, etc. Examples of humectant are glycerin, Hydroxyethyl urea, betaine, sodium PCA, Sodium-L-Lactate, etc.
11. **Perfumes:** Perfume is a substance that imparts a scent or order, including a sweet and pleasant smell. Examples of natural perfumes used in creams are- White Blossoms, Rosy Dreams, Orange Blossom
12. **Vitamins:** Vitamins plays an important role in maintaining the physiological function of whole body and the skin. Vitamin A, B, C, E etc. are generally used in formulation of the creams.
13. **Preservatives:** The use of preservatives in cosmetics is essential to prevent alteration caused by microorganism and contamination during formulation, shipment, storage and consumer use. Antioxidants can also be used to protect alteration caused by exposure to oxygen. Synthetic preservatives when used in low concentration effectively preserve the products.

### 1.7 MARKETED HERBAL FORMULATIONS OF ANTI-AGING:-

Table 1.3 Marketed Herbal Formulations for anti-aging

Name of Product	Herbal Ingredient	Brand Name
Youth elixir	Phyto retinol rose, Tiara flower	Oliva
Herbal Anti-aging Cream	Aloe vera extract, Goat milk, saffron, Ashwagandha, apple extract, almond oil, wheatgerm oil, kokum butter	Swati khadi

Natural age control Day cream with the power of bakuchiol	Bakuchiol (Natural alternative to Retinol), green tea extract, sea buckthorn oil, hyaluronic acid	The Moms Co.
Night face serum	Vitamin C, white lotus, hyaluronic acid, almond oil, olive oil, perfume, sesame oil, vitamin E	Pilgrim
Retinol night cream	Retinol, bakuchiol oil, rapeseed oil	Mama earth

## CHAPTER 2: REVIEW OF LITERATURE

1. **Misbah R., et al. (2021)** has reported that given the substantial benefits of **grape seed extract (GSE) in reducing oxidative stress**, the study aimed development, characterization and comparative analysis of GSE-based formulations. GSE-based emulsion and emulgel were successfully prepared and tested for their anti-aging potential on the skin. The tested formulations are effective and safe. Notably, **polyphenols in GSE have hydrating, anti-inflammatory and anti-wrinkle properties that promote skin hydration, elasticity and reduce roughness, scaliness, and wrinkles.**
2. **Induja K., Deepika D., et al. (2018)** has reported that **Reactive oxygen species induced oxidative stress plays a major role in skin aging by modulating the elastase enzyme level in the skin.** Extrinsic factors that affect skin aging such as UV radiation can also cause malignant melanoma. It has been observed that the Poly Herbal Formulation 1 was more potent than Poly Herbal Formulation 2 due to better anti-oxidant and anti-elastase activities in NIH3T3 fibroblast cells. In addition, Poly Herbal formulation 1 also had better anti-cancer activity in human malignant melanoma cells.
3. **Benmeziane F. (2017)** reported that **Antioxidant activity of methanolic grape extract was evaluated using the hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) scavenging activity.** The high percentages of H<sub>2</sub>O<sub>2</sub> scavenging activity were obtained for black varieties (Gros noir and Muscat noir) with 72.86 and 65.72, respectively.
4. **Sai Lakshmi J. et al. (2017)** reported that on **combining the extracts of curcuma longa, solanum lycopersum, carica papaya, 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 plant extracts it can be possible to increase the efficacy of extracts. In this regard, we mixed the extracts of curcuma longa, solanum lycopersum, carica papaya to improve as well synergize the cosmetic properties of prepared products compare to individual extracts. These studies suggest that composition of extracts and base of cream of F2 and F3 are more stable and safer.
5. **Arwa M. et al. (2012)** has reported that **carotenoids are known for their antioxidant activity and health promoting effects. One of the richest sources of carotenoids are carrots.** Conventional carotenoid extraction methods require the use of organic solvents, which are costly, environmentally hazardous, and require expensive disposal procedures. Pressurized Liquid Extraction (PLE) utilizes conventional solvents at elevated temperatures and pressure, and it requires less solvent and shorter extraction times. The extraction solvent of choice in this study was ethanol, which is a solvent generally recognized as safe.
6. **Nassim et al. (2012)** has reported that **antioxidant activities of essential oil components extracted from the separated organs of the Algerian medicinal and aromatic plant Daucus muricatus L. were studied.** The chemical composition of essential oils obtained by hydro distillation (HD) was investigated using Gas Chromatography–Retention Indices (GC-RI) and GC– Mass Spectrometry



(GCMS). Two types of essential oils were produced by *D. muricatus*: (i) The oil from roots is mainly composed by nonterpenic oxygenated compounds (59.8 g/100 g), and (ii) the aerial part oils (i.e., the leaves, stems, flowers, and umbels) was mainly composed by terpenic hydrocarbon compounds (62.3–72.2g/100 g).

7. **Brenes *et al.* (2010)** has reported that **Grape seed extract (GSE) provides a concentrated source of polyphenols that have antioxidant capacity. An experiment was conducted to investigate the effect of GSE at levels 0.6, 1.8 and 3.6 g kg<sup>-1</sup> in broiler chicks (1 to 42 days) on growth performance, relative weights (pancreas, spleen and liver) and lengths (duodenum, jejunum, ileum and ceca) of digestive organs, relative weights of liver fat and abdominal fat, ileal protein digestibility, excreta extractable polyphenol digestibility, and antioxidant activity of diet and excreta.**
8. **Hyesun *et al.* (2007)** has reported that the **biological benefits of certain carotenoids may be due to their potent antioxidant properties attributed to specific physico-chemical interactions with membranes.** To test this hypothesis, measured the effects of various carotenoids on rates of lipid peroxidation and correlated these findings with their membrane interactions, as determined by small angle X-ray diffraction approaches.
9. **Janisch *et al.* (2006)** has reported that **Grape seed is a complex matrix containing approximately 40% fiber, 16% oil, 11% proteins, and 7% complex phenols including tannins, in addition to sugars, and mineral salts, etc.** The enzymatic treatments hydrolyze, starch and protein, which may favor the release of phenolic compound. Hydrolysable phenolics and condensed tannins may be hydrolyzed partially by the enzymatic and acid treatments. The flavonoids of grape seed powder under condition of simulated digestion by HPLC.
10. **Sreemantula *et al.* (2005)** has reported that **the aerial parts of *Vitis vinifera* (common grape or European grape) have been widely used in Ayurveda to treat a variety of common and stress related disorders.** In the present investigation, the seed extract of *V. vinifera* was evaluation for antistress activity in normal and stress induced rats. Furthermore, the extract was studied for no tropic activity in rats and in-vitro antioxidant potential to correlate its antistress activity.

## CHAPTER-3:- PLANT PROFILE

### 3.1 GRAPES



Figure 3.1 *Vitis vinifera*

#### 3.1.1 Scientific Classification

- Kingdom: Plantae
- Division: Magnoliophyta
- Class: Magnoliopsida
- Order: Vitales

- Family: Vitaceae
- Genus: Vitis
- Species: *V. vinifera*

### 3.1.2 Biological Source

It consists of dried ripe fruits of *Vitis vinifera*.

### 3.1.3 Family

Vitaceae

### 3.1.4 Vernacular Names

- Sanskrit: Draksha
- English: Common grape vine
- Kula: Draksha

### 3.1.5 Varieties

- Green grapes
- Mudrika
- Gostani
- Haimvati
- Mrudvi
- Amrutrasa

### 3.1.6 Geographical Location

- North-west India
- Punjab
- Kashmir
- Maharashtra
- Andhra Pradesh
- Afghanistan

### 3.1.7 Description

Grapes are a type of fruit that grow in clusters of 15 to 300, and can be crimson, black, yellow, green, orange, and pink. “White Grapes” are actually green in color, and are evolutionarily derived from the purple grape.<sup>28,29</sup> Mutations in two regulatory genes of white grapes turn off production of anthocyanins which are responsible for the color of purple grapes. Anthocyanins and other pigment chemicals of the larger family of polyphenols in purple grapes are responsible for the varying shades of purple in red wines. Grapes are typically an ellipsoid shape resembling a prolate spheroid.

### 3.1.8 Chemical Constituents

- Grape seed extracts are industrial derivatives from whole grape seeds that have a great concentration of vitamin E, flavonoids, linoleic acid and phenolic OPCs.
- The typical commercial opportunity of extracting grape seed constituents has been for chemicals known as polyphenols having antioxidant activity in vitro.
- Polyphenols are the most important phytochemicals in grape because they possess many biological activities and health-promoting benefits.
- The phenolic compounds mainly include anthocyanins, flavanols, stilbenes (resveratrol) and phenolic acids.

### 3.1.9 Therapeutic Uses

- Grape seed extract may affect heart diseases such as high blood pressure and high cholesterol. By limi-

ting lipid oxidation, phenolics in grape seeds may reduce risk of heart disease, such as inhibiting platelet aggregation and reducing inflammation.

- A polyphenol contained in grape seeds is resveratrol, which may interfere with cancer cell growth and proliferation, as well as induce apoptosis, among other potential chemo-preventive effects.
- Dried grapes (raisins) were used for constipation and thirst.
- Round, ripe, sweet grapes were used to treat a range of health problems including cancer, cholera, smallpox, nausea, eye infections, and skin, kidney and liver diseases.
- Grapefruit is effective treatment for acne, while toning of congested skin, tightens skin. It also stimulates the lymphatic system and hence, clears the body of toxins.

### 3.2 CARROT



Figure 3.2 *Daucus carota*

#### 3.2.1 Scientific Classification

- Kingdom: Plantae
- Division: Angiospermae
- (Unranked): Eudicots
- (Unranked): Asterids
- Order: Apiales
- Family: Apiaceae
- Genus: *Daucus*
- Species: *D. carota*

#### 3.2.2 Biological Source

It consists of dried roots of *Daucus carota*.

#### 3.2.3 Family

Apiaceae

#### 3.2.4 Vernacular Names

- Sanskrit: Shikha mulam
- Hindi: Gajar
- Tamil: Karret
- English: Carrot

### 3.2.5 Varieties

- Orange carrot
- Purple carrot
- Red carrot
- Yellow carrot
- White carrot

### 3.2.6 Geographical Location

Europe and South-West Asia

### 3.2.7 Description

The carrot (*Daucus carota* subsp. *sativus*, Etymology: from Late Latin *carōta*, from Greek *καρότον* *karōton*, originally from the Indo-European root *ker-*(horn), due to its hornlike shape) is a root vegetable, usually orange in colour, though purple, red, white, and yellow varieties exist. It has a crisp texture when fresh. The most commonly eaten part of a carrot is a taproot, although the greens are edible as well. It is a domesticated form of the wild carrot *Daucus carota*, native to Europe and southwestern Asia. The domestic carrot has been selectively bred for its greatly enlarged and more palatable, less woody-textured edible taproot.

It is a biennial plant which grows a rosette of leaves in the spring and summer, while building up the stout taproot, which stores large amounts of sugars for the plant to flower in the second year. The flowering stem grows to about 1 meter (3 ft) tall, with an umbel of white flowers that produce a fruit called a mericarp by botanists, which is a type of schizocarp.

### 3.2.8 Chemical Constituents

- It contains monoterpene hydrocarbon compounds such  $\alpha$ - pinene and sabinene and phenylpropanoids compounds such as apiol, myristicin, and isochavicol.
- Also contain vitamins A and E and beta carotene.
- It is a good source of carbohydrates and minerals like Ca, P, Fe and Mg.

### 3.2.9 Therapeutic Uses

- The pro-vitamin A in it enhances immune system, promotes overall body growth and development, tissue maintenance and prevents xerophthalmia and night blindness.
- The phenolic compounds present in carrot like chlorogenic acid and Di caffeoylquinic acid scavenge free radicals and provide antioxidant potency.
- Used often to treat troublesome sensitive skin and helps with rashes, acne, and irritated skin and helps to reduce wrinkles. It also helps to protect the skin from the signs of aging.

## CHAPTER-4:- AIM AND OBJECTIVES

### 4.1 AIM OF WORK

Formulation and Evaluation of Polyherbal Cream for Skin Revitalization.

### 4.2 OBJECTIVES OF WORK

- Collection of materials.
- Authentication.
- Extraction of *Vitis vinifera* and *Daucus carota*.
- Formulation of cream using the two extracts.
- Evaluation of Polyherbal cream.

### 4.3 PLAN OF WORK

- Literature Survey.
- Selection of plants.
- Collection of the plant materials.
- Authentication.
- Extract preparation of individual plant materials.
- Formulation of the Polyherbal cream.
- Evaluation parameters of Polyherbal cream.
  - Color
  - Odour
  - Texture
  - Appearance
  - pH
  - Viscosity
  - Acid Value
  - Saponification Value
  - Washability
  - Spreadability

## CHAPTER 5

### EXPERIMENTAL

#### 5.1 MATERIALS AND METHODS

##### 5.1.1 PREPARATION OF PLANT MATERIAL

The plant materials were cut into small species and crushed using a blender. They were stored in airtight container.

##### 5.1.2 EXTRACT PREPARATION OF *Daucus carota*

- Carrots were weighed up to 40gram. They were cut into small pieces. They were then subjected to grinding and was taken into a beaker.
- To this 240ml of ethanol and 10 ml of Water was added and was then subjected to the water-bath for about 1 hour. -During this 1 hour it was continuously stirred at the time duration of 10 minutes and from this 10 ml was taken and was subjected to the Separating funnel.
- To this Separating funnel 10ml of Petroleum ether was added and 2 layers were formed, from which the upper layer was collected and the bottom layer was discarded.
- 



**Figure 5.1**



**Figure 5.2**



**Figure 5.3**



**Figure 5.4**

### 5.1.3 EXTRACT PREPARATION OF *Vitis vinifera*

- Grape seeds were taken and dried. They were crushed by using the Mortar and Pestle.
- The powder obtained was soaked into the 95% Ethanol and stand for about 7 days.
- It was then filtered and the extract was obtained.



**Figure 5.5**



**Figure 5.6**



Figure 5.7



Figure 5.8

## 5.1.4 FORMULATION

### 5.1.4.1 Composition

Table 5.1 Composition of cream base

INGRDIENTS	QUANTITY
Yellow beeswax	3.6gm
Liquid paraffin	10ml
Borax	0.2gm
Rose oil	0.1ml
Water	5.76ml

### 5.1.4.2 Procedure

- Grated the yellow beeswax into small pieces.
- Weighed the required quantity of Yellow bees wax and liquid paraffin and melt in China dish, by heating on a water bath up to 70°C.
- In a glass beaker, take required quantity of Borax and add water to it and heat up to 70°C.
- When both oily and aqueous phase reached the same temperature, gradually added borax solution to the melted beeswax drop by drop, with constant stirring.
- Stir continuously until it becomes cool, when the temperature lowers to 40-45°C, incorporated rose oil and mixed uniformly, until a homogenous semi-solid mass was obtained.

5.1.4.3 Combination of Plant extract

Table 5.2 Proportion of plant extracts used

Extract of plants	Extract Combination Number				
	F1	F2	F3	F4	F5
<i>Daucus carota</i>	1gm	1.5gm	2gm	2gm	2.5gm
<i>Vitis vinifera</i>	1gm	1.5gm	1.5gm	2gm	2gm



Figure 5.9 Formulations

1:1	1.5:1.5	2:1.5	2:2	2.5:2
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5.2 EVALUATION

Table 5.3 Evaluation

Sr. No.	Evaluation Parameters	F1	F2	F3	F4	F5
1.	State	Semi-solid	Semi-solid	Semi-solid	Semi-solid	Semi-solid
2.	Color	Light Brown	Yellowish Brown	Brown	Light Brown	Brown
3.	Odour	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant
4.	Texture	Smooth	Smooth	Smooth	Smooth	Smooth
5.	pH test	4.9	6.0	5.8	6.5	5.5
6.	Viscosity(cp)	29	28	22	30	20
7.	Acid Value	3.7	4.0	3.39	4.4	4.8
8.	Saponification Value	186	175	173	196	182
9.	Spreadability test	0.19	0.15	0.21	0.389	0.16



**1. Organoleptic Properties:****Table 5.4 Organoleptic Properties**

<b>State</b>	Semi-solid
<b>Colour</b>	Light Brown
<b>Odour</b>	Rose

**2. pH test:**

The pH test is a method of measuring the acid or the base level of any substances. An excessively high or low pH level of a cosmetic product can cause skin irritations and other issues that should be avoided.

**Apparatus:** pH paper.

**Method:** 2g of the sample was taken and pH paper was placed onto it.

**Standard:** 6.0 to 7.4

**Result:** 6.8 (So, this test is considered as Pass.)

**3. Viscosity:**

This test is checked to ensure that the cream will keep a consistent degree of quality at all times.

**Apparatus:** Brookfield viscometer.

**Method:** Viscosity was checked by using the Brookfield Viscometer.

**Standard:** 10 to 30cp.

**Result:** 30cp (So, this test is considered as Pass.)

**4. Acid Value test:**

The acid value is defined as the number of milligrams of Potassium hydroxide required to neutralize the free fatty acids present in one gram of fat.

**Apparatus:** Apparatus of Titration.

**Method:** 10g of sample was subjected to the 50ml mixture of the alcohol and solvent ether, this was heated for some time and to this Phenolphthalein was added and was titrated against 0.1N KOH until pink colour was obtained.

**Standard:** 3 to 5.

**Result:** 4.4.

**5. Spreadability test**

Cream base should spread easily without too much drag and should not produce greater friction in the rubbing process.

**Apparatus:** Glass slide, 100 gm wt.

**Method:** 2gm of sample was taken and placed between two glass slides and a weight of 100gm was placed over it.

**Standard:** 0.1 to 1.8 gm cm/s.

**Result:** 0.389 gm cm/s.

**6. Saponification Value test:**

Saponification Value is defined as the number of milligrams of Potassium Hydroxide required to saponify 1g of fat.

**Apparatus:** Apparatus of titration.

**Method:** 2g of cream was added to the 25ml of 0.5N KOH sol. Nd was heated in the water-bath for about 30 minutes and was titrated against 0.5N HCl using Phenolphthalein as an indicator.

**Standard:** 172 to 199.32.

**Result:** 196.

**CHAPTER 6:  
RESULT AND DISCUSSION**

**6.1 ANTIOXIDANT ACTIVITY OF BOTH EXTRACTS**

- A solution of hydrogen peroxide (40mM) was prepared in phosphate buffer (pH 7.4)
- The concentration of hydrogen peroxide was determined by absorption at 230nm using a spectrophotometer. Extracts (0.1 – 1 mg/ml) in distilled water were added to a hydrogen peroxide solution (0.6 ml, 40mM).
- The absorbance of hydrogen peroxide at 230 nm was determined after ten minutes against a blank solution containing phosphate buffer without hydrogen peroxide.
- The percentage of hydrogen peroxide scavenging by the extracts and a standard compound was calculated as follows:

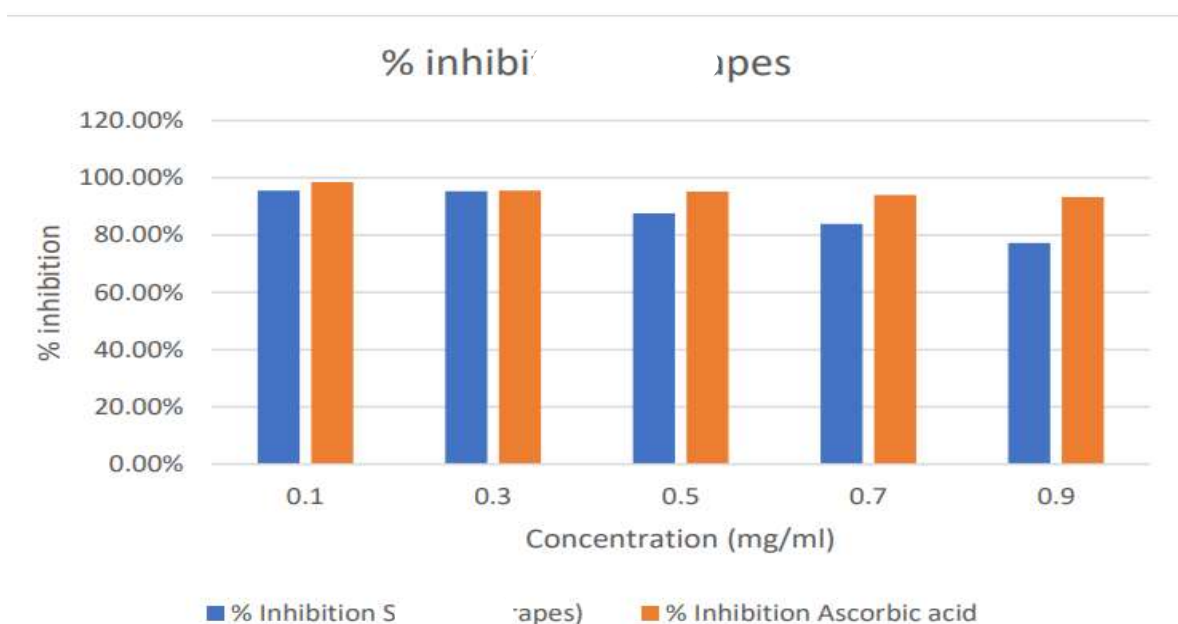
$$\% \text{ inhibition} = \frac{(\text{Absorbance control} - \text{Absorbance Sample})}{(\text{Absorbance Control})} \times 100$$

**6.1.1 Hydrogen peroxide scavenging activity of Extracts**

**Table 6.1 Effect of Sample (*Daucus Carota* & *Vitis Vinifera*) in hydrogen peroxide scavenging activity**

Concentration (mg/ml)	% Inhibition	
	Sample	Ascorbic Acid
0.1	96.1%	98.53%
0.3	95.16%	95.53%
0.5	94.9%	95.20%
0.7	94.1%	94.05%
0.9	86.6%	93.33%

**Discussion: Samples of both *Daucus carota* and *Vitis vinifera* inhibited the production of hydrogen peroxide by showing the strong Scavenging activity as compared to the ascorbic acid.**



## 6.2 PHYSICAL EVALUATION OF DEVELOPED POLYHERBAL FORMULATION

**Table 6.2 Physical evaluation of different cream formulation**

Sr. No.	Evaluation Parameters	Formulation-4	Standard Values	Remark
1.	State	Semi-solid	-	Comply
2.	Colour	Light-brown	-	Comply
3.	Odour	Pleasant	-	Comply
4.	Texture	Smooth	-	Comply
5.	pH test	6.5	6.0-7.4	Comply
6.	Viscosity(cp)	30	10-30	Comply
7.	Acid Value	4.4	3-5	Comply
8.	Saponification Value	196	172-199.32	Comply
9.	Spreadability test (gm cm/s)	0.389	0.1-1.8	Comply

**Discussion:** Table shows that all the results of the Evaluation parameters are complied with the standard values and are satisfactory.

## CHAPTER 7

### CONCLUSION

Skin aging is a complex, progressive, time-dependent deterioration caused by intrinsic and extrinsic factors or environmental factors. Skin is equipped with an elaborate antioxidant system that protects it from oxidative damage due to intrinsic and extrinsic factors. To overcome the problem of skin ageing many medicinal plants have been extensively studied as alternative treatment for diseases. For that *Vitis vinifera* (Grape) and *Daucus carota* (Carrot) were selected.

It is concluded that on combining the extracts of *Vitis vinifera* and *Daucus carota* in different ratio to get multipurpose effect such as Whitening, anti-wrinkle and Anti-ageing 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 plant extract it can be possible to increase the efficacy of extract. In this regard we mixed the extracts of *Daucus carota* and *Vitis vinifera* to improve as well as synergize the cosmetic properties of prepared products compare to individual extracts. The formulation of anti-ageing herbal cream containing *Vitis vinifera* and *Daucus carota* extracts was prepared and evaluated. The cream showed desirable anti-oxidant activity when compared with ascorbic acid standard. Hence it is efficient to produce its anti-aging effect to prevent skin from harmful UV radiation which is the major cause of aging.

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