



# FORMULATION AND EVALUATION OF ANTIWRINKLE ACTIVITY OF CREAM OF MORINGA OLEIFERA LEAVES

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**Abstract :** Moringa Oleifera leaves as one of the main ingredients. Moringa Oleifera is known for its antioxidant properties, which can help in reducing the appearance of wrinkles and fine lines. The cream is formulated by extracting the active compounds from the leaves and incorporating them into a suitable base. To evaluate the antiwrinkle activity, various tests can be conducted such as in vitro assays to measure collagen production, elastin synthesis, and antioxidant activity. Additionally, in vivo studies can be performed on human subjects to assess the cream's effectiveness in reducing wrinkles and improving skin elasticity. These evaluations help determine the cream's potential as an antiwrinkle product. Moringa oleifera was studied for its antiaging benefits as the seed oil is rich in antioxidants that might prevent the oxidative damage of the skin. By using the Moringa seed oil in various ratios, cream and nano emulsion were prepared and they are characterised for its physical properties. The best formula was optimised which has been evaluated for antiaging activity using animal models by topical application of the formulations for two times a day upto 30days and the results were compared with the standard.

**Key words**–Antioxidant , Cream, Moringa Oleifera, wrinkles, oxidation damage

## 1. INTRODUCTION

### 1.1 WRINKLES

Wrinkles are lines that form on your skin. They're a natural part of your body's aging process. Wrinkles on your skin look similar to the wrinkles you get on a shirt that needs ironed. They appear as folds, creases or ridges. They're most often found on your face, neck and arms, but wrinkles can appear anywhere on your body. Skin disorders associated with photo damage from ultraviolet light include wrinkles, hyperpigmentation, tactile roughness, and telangiectasia, and are more common in people with white skin compared with other skin types. Wrinkles are also associated with ageing, hormonal status, smoking, and intercurrent disease. Wrinkles are visible creases or folds in the skin. Wrinkles less than 1 mm in width and depth are defined as fine wrinkles. Wrinkles may be caused by intrinsic factors and by extrinsic factors. These factors contribute to epidermal thinning, loss of elasticity, skin fragility, and creases and lines in the skin. The severity of photo damage varies with skin type, which includes skin colour and the capacity to tan. Wrinkles begin to appear, around thirty years old, around eyes and mouths and on foreheads and necks.



**Fig.01 wrinkles**

### **Cause's of Wrinkles**

Slow skin cell production, thinning skin layers and a lack of collagen proteins causes wrinkles to form on your skin. Collagen is a protein within your body that gives your skin structure. It provides stretchiness or elasticity so you can move easily. Your skin is similar to a rubber band. If that rubber band stretches or moves too much, the rubber band becomes loose and loses its ability to snap back to its normal size and shape. When your body's cells age, their ability to produce proteins slows down. This makes it more difficult for your rubber band to snap back to its original shape, which causes wrinkles. Skin elasticity is one of the major factors in skin's health; low tensile strength of skin, excessive stress, improper hormone balance and mutation also leads to skin tension and wrinkling.

### **There are several factors that cause your skin to wrinkle**

**Age:-**As you get older, your skin naturally becomes less elastic and more fragile. Decreased production of natural oils dries your skin and makes it appear more wrinkled. Fat in the deeper layers of your skin diminishes. This causes loose, saggy skin and more-pronounced lines and crevices. Aging is a common process of human beings in which there is inability in maintenance of homeostasis and risk of dying increases. After the age of 20 its symptoms appears as the collagen content per unit area starts decreasing, there is 1% decrease in collagen content per unit area of the skin every year.

**Exposure to ultraviolet (UV) light:-**Ultraviolet radiation, which speeds the natural aging process, is the primary cause of early wrinkling. Exposure to UV light breaks down your skin's connective tissue collagen and elastin fibers, which lie in the deeper layer of skin (dermis). Without the supportive connective tissue, your skin loses strength and flexibility. Skin then begins to sag and wrinkle prematurely.

**Smoking:-** Smoking can accelerate the normal aging process of your skin, contributing to wrinkles. This may be due to smoking's effect on collagen. the smoke extract of tobacco disturbs the production of collagen fibres and hence skin elasticity.

**Repeated facial expressions:-**Facial movements and expressions, such as squinting or smiling, lead to fine lines and wrinkles. Each time you use a facial muscle, a groove forms beneath the surface of the skin. And as skin ages, it loses its flexibility and is no longer able to spring back in place. These grooves then become permanent features on your face.

**Allergy:-**Due to rubbing and inflammation caused by allergies can make the skin dry and which causes fine lines and wrinkles on the skin.

**Diet with high sugar:-**As the sugar rich product contain less antioxidant which creates more chances of getting wrinkles and lines on the skin especially around eyes.

**Personal habits:-**The formation of crinkling area around the eyes caused due to sleeping on the stomach helps to develop wrinkles.

### Prevention tips for wrinkles

One can prevent the wrinkles formation by using below preventive majors.

**Protect skin from the sun:-** one can protect their skin from wrinkles by spending less time in the sun and also by wearing protective cloths like hat, dress with full sleeves, etc.

**Avoid smoking:-**By quitting smoking one can improve their skin tone.

**Healthy diet:-** The diet with rich of vitamins and antioxidant such as vegetables and fruits may help to nourish the skin and prevent from formation of wrinkles.

**Drink a plenty of water:-**This is a universal solution for any kind of problem associated with human health. Drinking a proper amount of water helps to hydrate the skin cells hence it prevents formation of lines on skin.

**Reduction of stress:-**The excessive stress may leads to increase the level of stress hormones such as cortisol which has ability to affect the connective tissue of the skin results in premature wrinkling.

### Symptoms

Wrinkles are the lines and creases that form in your skin. Some wrinkles can become deep crevices or furrows and may be especially noticeable around your eyes, mouth and neck.

- Lines, creases or folds on your skin.
- Loose or droopy skin.

Wrinkles can appear anywhere on your skin but are most common on you're:

- Face
- Hands
- Neck
- Arms
- Legs

The main Cause of wrinkles is loss of collagen

### What causes collagen loss?

Factors that may contribute to lead to collagen loss or low collagen levels include:-

- Hormonal changes due to pregnancy, menopause, health conditions, and so on

- Oxidative stress, which results from metabolic processes and lifestyle choices, such as smoking and diet.
- The natural process of aging.
- Too much sun exposure, as ultraviolet rays can cause collagen to break down in the skin.
- low levels of ascorbic acid, also known as vitamin C, which can lead to scurvy Some genetic conditions can affect the production of collagen.

### Preventing collagen loss

Here are some strategies that may help prevent collagen loss:

- Eat plenty of fruits and vegetables, as they contain vitamins and antioxidants.
- Avoid smoking and processed foods, which increase the risk of oxidative stress.
- Protect the skin from sun exposure.
- Ask a dermatologist about supplements and other products.

### 1.2 CREAM

Creams are the topical preparations which can be applied on the skin. 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. These products are designed to be used topically for the better site specific delivery of the drug into the skin for skin disorders.

### TYPES OF SKIN CREAMS

They are divided into two types

**Oil-in-Water (O/W) creams** which are composed of small droplets of oil dispersed in a continuous phase, and an emulsion in which the oil is dispersed as droplets throughout the aqueous phase is termed an oil-in-water (O/W) emulsion

**Water-in-Oil (W/O) creams** which are composed of small Droplets of water dispersed in a continuous oily phase. When Water is the dispersed phase and an oil the dispersion medium, The emulsion is of the water-in-oil (W/O) type

### CLASSIFICATION OF CREAMS

All the skin creams can be classified on different basis:

1. According to function, e.g. cleansing foundation,, 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. Makeup 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
  - b) Moisturizing creams.
4. All purpose cream and general creams.
5. Night cream and massage creams.
6. Skin protective cream
7. Hand and Body Cream

#### 1.4 ANTI WRINKLE CREAM

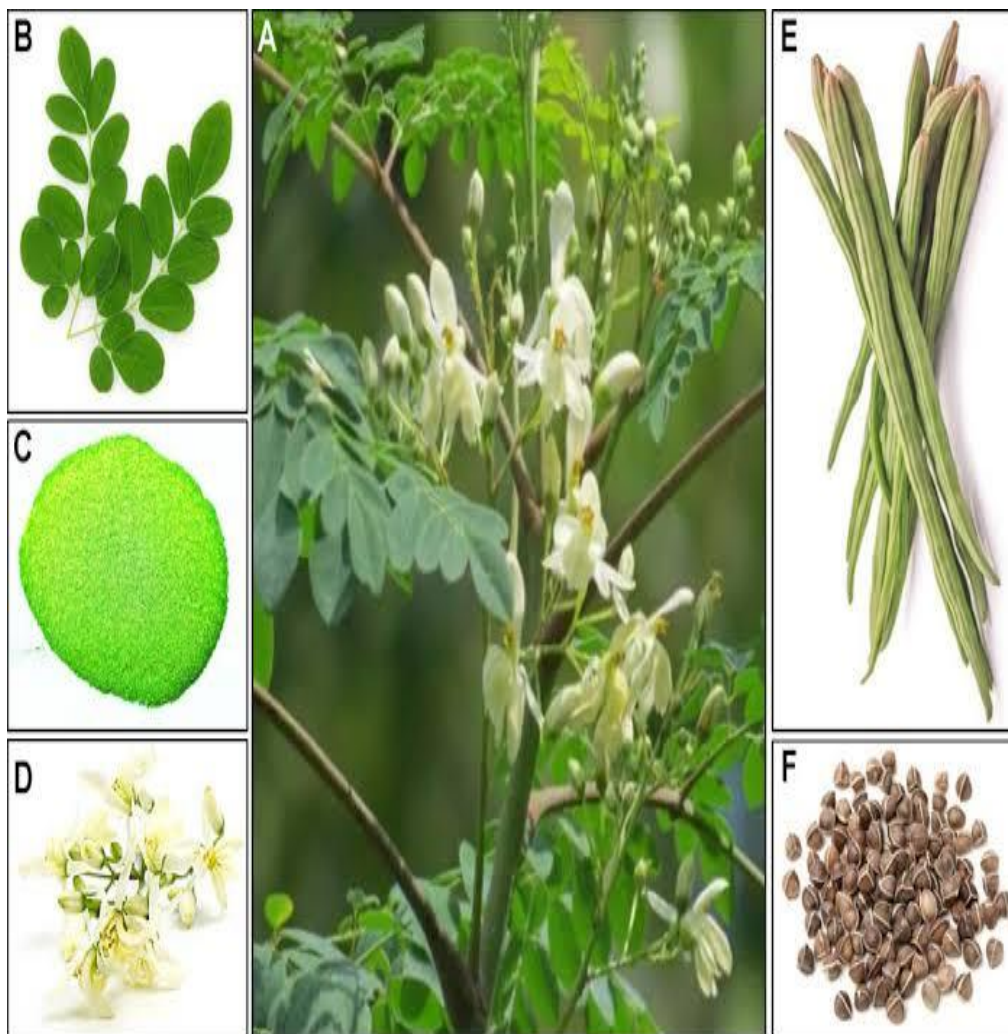
Anti-aging creams are predominantly moisturizer-based skin care products marketed with unproven claims of making the consumer look younger by reducing, masking or preventing signs of skin aging.



**Fig.02 Anti-Wrinkle cream**

#### 1.5 Moringa oleifera (plant material)

Moringa oleifera is called a 'Miracle Tree' due to its multipurpose nutritional uses and capacity to cure many diseases. Every part of plant has reserved nutrients. The Leaves of Moringa oleifera are rich source of minerals like calcium, potassium, zinc, manganese, iron and copper. The Leaves have low calorific value so can be used in the diet of obese. The leaves also contain all essential amino acids and are rich in protein and minerals. Vitamins like vitamin A, Vitamin B, Beta-carotene, pyridoxine, nicotinic acid, vitamin C, Vitamin D and E also present in abundant amount in Moringa oleifera. Moringa oleifera belonging to the family of Moringaceae is an effective remedy for malnutrition.



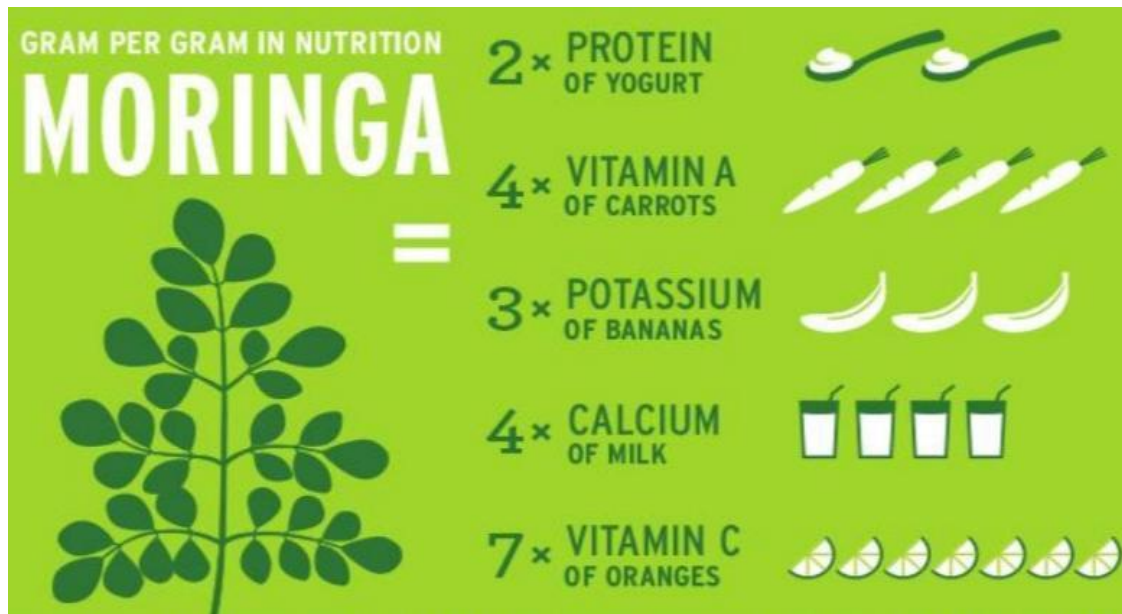
**Fig.03 Moringa**

### **Moringa Good for Skin Care:-**

Your skin requires proper nourishment too for that perfect glow and radiance. This wonder herb is loaded with nutrients like calcium, vitamin A, B, C, D, E; minerals like copper, iron, zinc, magnesium, silica, and manganese. These all are essential to give your skin the necessary boost to stay healthy for a longer run. Also, Moringa has excellent moisturizing and nourishing properties as well that makes it an important part of the modern skin care products including Ayurveda. Below mentioned are some of the top skin care benefits of using Moringa.

### **Nutritional properties**

Drumstick pods and leaves are a storehouse of essential nutrients, whereas the leaves are the most nutrient part of the plant and one of the finest sources of calcium, iron, zinc, selenium and Magnesium. Fresh pods and seeds are a great source of oleic acid, a healthy fatty acid which is known to promote heart health. Moringa leaves is unique among all the greens as it is heaped with a good amount of protein about 9.8 gram of protein per 100 grams. Dry powdered leaves are an amazing source of good quality essential amino acids.



**Fig.04 Nutrition By Moringa**

➤ **Nutritional Value Of Drumstick Per 100 grams**

- Energy 64 kcal
- Carbohydrates 8.2g
- Dietary fibre 20g
- Fat 1.40
- Protein 9.40

➤ **Vitamins**

- Vitamin A 378µg
- Thiamine (B1) 0.257 mg
- Riboflavin (B2) 0.660 mg
- Niacin (B3) 2.220 mg
- Pantothenic acid (B5) 0.125 mg
- Vitamin B6 1.2 mg
- Folate (B9) 40 µg
- Vitamin C 51.7 mg

➤ **Minerals**

- Calcium 185 mg
- Iron 400 mg
- Magnesium 147 mg
- Manganese 0.36 mg
- Phosphorus 112 mg
- Potassium 337mg
- Sodium 9 mg
- Zinc 0.6 mg

**Moringa for Anti-Aging**

Both Moringa oil and Moringa leaf powder can be used to prevent aging signs like wrinkles, and free radical damage to the skin. Its regular use can help in removing blemishes from your skin, eventually making you look younger.



## Moringa for Complexion

Moringa, in any form, when used properly on a regular basis can improve your facial complexion. Our skin gets dark because of melanin deposition that prevents us from harmful UV rays. But uneven skin tone can make your overshadow your personality. Therefore, a face pack made out of Moringa leaves can give you an even tone.

## Moringa for Fighting Acne

Moringa has antibacterial properties which are why it is known to prevent acne breakouts on the facial skin. Whether it is being consumed or applied externally, you will get to see the same results in fewer days. However, before applying anything on your face, or even consuming, you should contact your doctor first.

## Detoxification

One of the major reasons behind poor skin health is the presence of toxins in the body. Therefore, by consuming Moringa seeds or powder first thing in the morning, you will see the desired results. It might help purify your blood that will eventually provide you with clearer and healthier skin.

## Reduction in Large Pores

Moringa herb acts on large open pores of the skin that further tightens the skin. It has skin health boosting collagen protein, which helps in reducing pores to the most extent. So, if your skin routine has been missing Moringa herb, then it is the right time to incorporate it in.

## Treating edema

Edema is when fluid builds up in body tissues, for instance, because of inflammation. Ear edema can cause tissue swelling around the ear, usually because of an infection. In one study, applying moringa seed oil reduced skin inflammation in mice with ear edema. This suggests the anti-inflammatory properties of moringa may help treat ear edema, although more research is needed.

## 2.RESEARCH METHODOLOGY

### Collection of Sample

Herbal pure aloe Vera gel is extracted from the plant and coconut oil, orange peel powder, drumstick powder and jasmine fragrance. Chemicals used are of analytical reagent grade.

### Preparation of Herbal antiwrinkle Cream

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

#### Phase 1: Oil Phase:-

Melt the given quantity of the beeswax in a beaker with the help of indirect heating method (in a water bath) at 65-70°C temperature. After melting of beeswax, required quantity of liquid paraffin taken in separate beaker then beeswax and liquid paraffin both the heated on water bath at 65-70°C constant temperature.

#### Phase 2: Water Phase:-

Dissolve the Borax in water with the help of heat. Weigh about 6.5 gram of orange powder than add 20 ml of water for dissolution and heated on water bath. Same procedure follow for the drumstick powder, when both the solution reach at 70° temperature; remove it from water bath and cool it down to the room temperature then filtered it.



**Phase 3: Final Formulation:-**

Paraben as preservative, As compared to other creams this cream Firstly, the oil phase ingredients such as beeswax and liquid paraffin are poured into mortar-pestle than add water phase ingredient borax gradually with constant stirring till cream like consistency obtain and continue this whole process for around 5 minutes. After that required amount of coconut oil is added and triturate constantly in one direction. Afterwards, add prepared water phase ingredients in the mixture such as Orange peel extract, Drumstick extract and Aloe vera extract with a time interval and then again triturate until it combines with oily phase and gives cream like formation. Add methyl may be made heavier by adding more wax.

**Table no. 1 Optimized Formulation Table for Herbal Cream (For 50gm) Formula Used for Moisturizing Cream (For 50gm)**

Sr. No.	Ingredients	Quantity (50 gm )	Role of ingredients
1.	Beeswax	7.5 gm	Cream base, Increase water holding capacity
2.	Powdered Borax	0.25 gm	Preservation, Soften the water phase
3.	Liquid paraffin	23 ml	Cream base
4.	Coconut oil	0.75 ml	Anti-bacterial ,Anti-fungal , Antioxidant
5.	Orange peel powder	6.5 gm	Antioxidant
6.	Drumstick powder	6.5 gm	Anti-fungal property
7.	Aloe Vera extract	4.5 ml	Cooling property, Anti-inflammatory
8.	Jasmine fragrance	2-3 drops	Flavouring agent
9.	Methyl paraben	0.001 gm	Preservation
10.	Water	q.s.	Vehicle

**Table no 2 Formula Used for Moisturizing Cream**

Ingredients	Batches			
	F1	F2	F3	F4
Beeswax	7.50 gm	7.50 gm	7.50 gm	7.50 gm
Borax	0.25 gm	0.25 gm	0.25 gm	0.25 gm
Liquid paraffin	23 ml	23 ml	23 ml	23 ml
Coconut oil	0.75 ml	0.75 ml	0.75 ml	0.75 ml
Orange peel powder	6.5 gm	6.5 gm	6.5 gm	6.5 gm
Drumstick powder	6.5 gm	6.5 gm	6.5 gm	6.5 gm
Aloe Vera extract	-	-	2.25 ml	4.5 ml
Methyl paraben	0.001 gm	0.001 gm	0.001 gm	0.001 gm
Jasmine fragrance	2-3 drops	2-3 drops	2-3 drops	2-3 drops
Water	q.s	q.s	q.s	q.s

**4.EVALUATION PARAMETERS OF CREAM**

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

**Washability:** When cream is applied on skin it is Completely absorbed and gives cooling effect. Easily Washable in water without rubbing.

**Viscosity:** Viscosity of formulated cream was determined by brook filed viscometer at 20 rpm using spindle no. LV-4(64). The viscosity of cream was in the range of 30000 to 49990 cp w/which indicates that the cream is easily spreadable by small amount of shear. The formulated cream shows the viscosity within Le. 48890cp.

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

**Saponification value:** The saponification value results of formulated cream were shown in table no. 3 and showed satisfactorily values.

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

## 5.RESULT AND DISCUSION

### Organoleptic properties

Table no.03 physical properties

Sr. No	Parameters	Observation
1.	Colour	Light green
2.	Odour	Jasmine like pleasant
3.	Texture	Smooth
4.	Appearance	Like curd

Table no.4 F1,F2,F3,F4 formulation

Sr.no.	Test/ Evaluation	Specifications	F1	F2	F3	F4
1.	Colour	Light green	Light green	Light green	Light green	Light green
2.	Odour	Jasmine like pleasant	Jasmine like pleasant	Jasmine like pleasant	Jasmine like pleasant	Jasmine like pleasant
3.	Texture/Appearance	Smooth	Stiff	Stiff	Liquidy	Smooth
4.	Spreadability	Good spreadability	Good spreadability	Good spreadability	Good spreadability	Good spreadability
5.	Washability	Easily washable	Not washable	Not washable	Easily washable	Easily washable
6.	Irritancy	No redness and inflammation	No redness and inflammation	No redness and information	No redness and information	No redness and information
7.	pH	5.6 to 6.8	5.3	5.5	6.4	6.3

## 6.CONCLUSION

The importance of herbs in the cosmeceutical has been extensively increased in personal care system and there is a great demand for the herbal cosmetics nowadays. Herbal cream is a non-toxic, safe, effective formulation which improves patient compliance by the utilization of herbal extracts and hence it would be highly acceptable than synthetic ones. The formulated cream showed good results including consistency and spread ability, homogeneity, pH, non- greasiness. There is also no phase separation observed during study period of research. The prepared moisturizing cream can be considered safe to use as it is developed from herbal extracts.

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