

Formulation development and facial skin evaluation of face serum containing bitter melon (*Momordica charantia*. linn) extract: A research

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Abstract

Cosmetic serum is highly concentrated product based on water or oil. Serum has a property of rapid absorption and ability to penetrate into deeper layers of the skin. Bitter melon provide health benefits against various ailments for improving the quality of life. It decreases ageing and fights acne and skin blemishes. Bitter melon is also has antioxidant properties that can prevent premature aging. Bitter melon is a natural (karela) consist of fresh green fruits of plant known as *Momordica charantia*. linn. This Serum made up of *Momordica charantia* extract. Bitter melon serum was tested for its PH, Physical appearance (Colour, Odour, texture), Spreadability. microbial testing, Cyclic temperature. The various physical, chemical, Biological evaluation were done. The formulation found to be good Spreadability, glowing on skin. The aim of this project is Face serum for glowing, Antiaging activity on skin.

Keywords: antioxidant, bitter melon, antiaging

Introduction

Bitter melon is known as bitter gourd omordicacharantia belongs to cucurbitaceae family. In Ayurveda medicine, bitter melon known as (Karela). Very important natural plant. Bitter melon grows well in hot and humid areas with well drained sandy loam soil. Serum is a skin care product containing Bitter melon extract, Aloe vera gel, Vitamin E, Tween 20 polymer, Lavender oil, Glycerine etc

It is a good source of fiber, nutrients, moisture, amino acids, beta carotene, vitamin C, vitamin B, folate and minerals such as calcium, sodium, potassium, magnesium, phosphorus, zinc and iron, as well as folic acid, alkaloids, peptides and steroidal saponins. It is a well-known Indian traditional vegetable used by diabetic patients as it contains a component, charantin, that is a hypoglycemic and antidiabetic agent. Apart from this, bitter gourd possesses many other medicinal activities, such as antiviral, antioxidant, anti-inflammatory, antimutagenic, antiulcerogenic, antimicrobial, anticonstipation, analgesic and anticarcinogenic. This face-serum will help replenish the moisture in your skin leaving it smooth, supple, and hydrated. This Serum has excellent anti-inflammatory properties. It can treat various skin conditions like eczema, rashes, leprosy, psoriasis, wounds, and sores. The mostly indigenous tribes of Africa and Asia use a paste made from the bitter gourd plant to apply on blisters and injuries topically.

Aging is a complex phenomenon, resulting from accumulation of changes due to the genetic variation, environmental aggressor, nutrition intake and individual lifestyle that happen in living organism throughout their life time and which reduce their ability to survive stress. Aging has caused the collagen to increase in density, but loose the extensible configuration which result in fragmented, disorganized and less soluble collagen. This is due to the alteration at the connective tissues through the formation of lipid peroxide, cell contents and enzyme. So Bitter melon shows antiaging action.



Fig 1: Bitter melon

Health Benefit

1. Helps to maintain blood sugar level
2. Aids in blood purification
3. Helps in weight loss.
4. Helps to prevent cancer.
5. Gives relief from hemorrhoid.
6. Improve body immunity.
7. Acts as an antifungal agent.
8. Take care of your eyes.

Table 1: Classification of *Momordica charantia*.

Kingdom	Plantae
Common name	Karela Bitter gourd
Order	Cucurbitales
Species	M.charantia
Genus	Momordica
Family	Cucurbitaceae
Class	Magnoliopsida
Division	Magnoliophyta

Bitter melon plant description: The plant is monoecious slender, tendril climbing annual vine of almost 2 to 4 m high. Different varieties of bitter melon have different shapes of fruits being aoid, ellipsoid to oblong etc. Fruits 2 to 10 cm long.

***Biological compound present in bitter melon.**

1. Commonly sugar, protein, and chlorophyll while secondary metabolites are phenolics carotenoids, saponin, alkaloids etc.
2. Aqueous extract of bitter melon contained carbohydrates, protein, amino acid, sterol, flavonoids, cardiac glycoside etc.

Table 2

Category	Compound identify	Plant par
Phenol c	*Flavonoids such as catechin	Fruits
	*Non flavonoids such as gall c acid	Leaves
	*Tannin	Fruits
Carotenoids	*Alpha & beta carotene	Fruits
	*Lutein	
Phytosterol	B.sitosterol Decor inone	Fruits

Importance of ingredients

a. Bitter melon: Main purpose is Antiaging property and also antioxidant, treat in skin infection etc. Bitter melon compatible with glycerine so base is very good for serum.

1. **Acne:** Bitter melon diminsh the rigorousness of acne.

2. **Freshness:** It help in increases distribution of blood so provide oxygen exchange among cell, hence giving them nourishment.

b. Aloe vera gel: In Bitter melon face serum aloe vera gel act as a moisturizing agent & Softening property.



Fig 2: Aloe vera.

c. Vitamin E: Reduce skin itching, stimulate cell renewal and reduces skin dullness. Vitamin E help with sunburn and other Complexion problem, Vitamin E has an outstanding possession in diminshing hurting of sunburn.

d. Tween 20: It's act as Viscosity modifier and stabilizer of essential oil in water. Essential for viscosity. which impart to serum looks.

e. Essential oil: Lavender oil is used in face serum. It is essential to condition the skin. Lavender oil is act as a antibacterial agent.

f. Glycerne: It act as a Humectant. preserve moisture. Glycerin also act as preservatives.

Material and methods

Plant material: Fruits of Mormodica charantia.

Method

Step I: preparation of extracted juice. Fresh, green bitter gourds were purchased from the market These were washed manually with water for removal of dirt or other particles on the outer part of the fruit. They were cut into small pieces, placed in a beaker along with water and heated in a water bath for a certain time. After completion of heating, extracted juice was allowed to cool and then filtered using nylon mesh cloth to remove the fruit pulp and suspended solids, and the collected filtrate was used for various analyses.



Fig 3: Bitter melon extract in measuring cylinder.

**Methods of preparation
Step II**

Table 2: The emulsion o/w was prepared according to the formula a given below

Ingredient	Standard formula (100ml)	Working Formula(30ml)	Role
Bittermelon (extract)	60%	12 ml	Antiaging, Antioxidant, Skin glowing effect.
Aloe vera gel	50%	10 gm	Moisturizing agent.
Vitamin E	1%	0.2ml	Antioxidant
Glycerine	25%	5 ml	Humectant Preservatives
Lavender oil	0.1%	0.02 ml	Essential oil for anti-inflammatory effect and antibacterial.
Tween 20	1%	0.2 ml	Viscosity Modifier
water	Q.s to 100%	Q.s to 30 ml	Vehicle.

Step III

The oily component consisting Lavender oil is mixed with Tween 20. For 10min to obtain uniform solution.

Step IV

In bitter melon extract added at the same time water phase prepared by mixing aloe vera gel, glycerine, small amount of de-mineralized water uniformly.

Step V

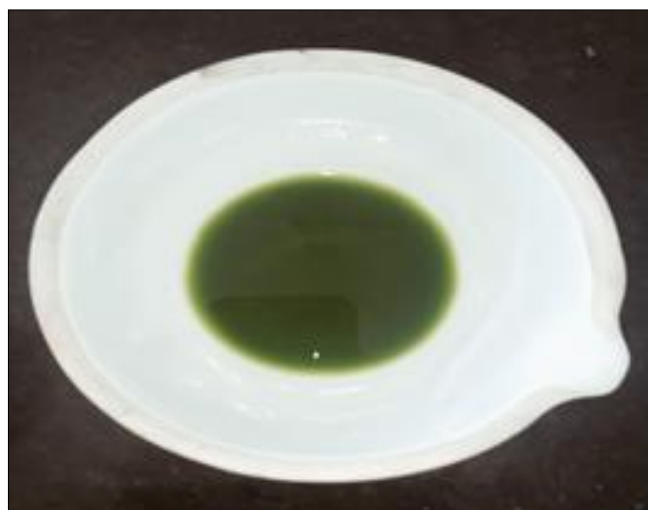
Both phases are mixed to each other. Also add Drop wise vitamin E.

Step VI

Stir properly and mix it well with the mixture.

Once the serum mixture is throughly mixed, take a container or droper bottle and tranfer the serum into it.

Shake the serum bottle well to mix all the ingredient. Use it on your skin and let it sleep into your overnight. Rinse in morning.

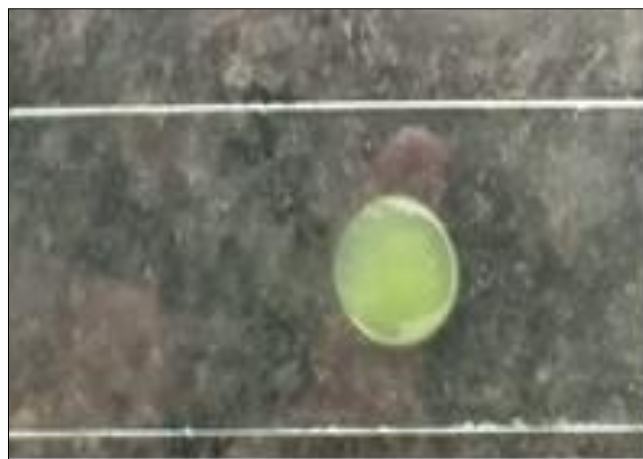
**Fig 4****Evaluation of face serum**

1. Physical evaluation: colour and appearance-The colour and appearance of formulation was observed visually.

2. Determination of Spreadability: Small quantity of serum sample was placed on surface readily spreads on application to skin.

3. Homogeneity: The formulation prepared had even distribution of extract made preparation was confirmed visually by absence of any particulate matter and also feeling the product by touch.

4. Globule size determination: The prepared serum was properly analyzed under microscope.

**Fig 5**

5. PH of face serum: Is very essential parameter. It is suitable for skin.

6. Stability studies: carried out as per ICH guideline sample were stored different storage condition of temperature such as 3-5 degree Celsius, 25 degree Celsius RH =60%.

7. Cyclical temperature test: This test is not carried out any fixed temperatures and humidity.

**Temperature changed cyclically everyday
Discussion & Result****Table 3:** Physical evaluation

Colour	Greenish translucent
Odour	Character stics
Texture	Smooth Gel like
Homogeneity	Good

2. Spreadability of liquid formulation that is ability of face serum to spread over the skin.

3. Globule size determination: Globule size was found to be range of 0.1-0.2. that is better effect and faster action.

4. PH: of formulation was found to be 6.4 as the skin having acidic PH around 4.1-6.4 this range of formulation is suitable for use.

Table 3: Cyclical Temperature Test

Parameters	Stability
Freezer temperature	Stable
Room Temperature	Stable (favorable)

Table 4: Stability studies

Temperatures	Evaluation parameters	Observation 1 week	Observation 2Week
3-5 degree Celsius	*Visual appearance	Translucent	Translucent
	*Phase separation	No	No
	*Homogeneity	Good	Good
	*Visual appearance	Green	Green
25 degree Celsius RH =60%	*Visual appearance	Green	Green
	*Phase separations	No	No
	*Homogeneity	Good	Good
	*Visual appearance	Green	Green

Conclusion

The aim of the study was to formulate and evaluate Facial Skin of Serum Containing Bitter melon (*Momordica charantia*.Linn) Extract: for Antiaging, Antioxidant effect and Skin glowing activity. Aloevera, Vitamin E are mainly used in serum for Smoothing and moisturizing purpose.

Spreadability was found to be good. Microbial examination of serum revealed that the formulation is free from microorganisms and safe for use.

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