

# Formulation and Evaluation of Multipurpose Cosmetic Cream

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## ABSTRACT

Cosmetic Creams are the preparation used to enhance the human appearance. The main Aim of our work was to develop a Cosmetic cream which can give multipurpose effect like moisturizer, Anti-aging, and Antioxidants, herbal ingredients in our preparations is Green Tea. All the products were found to be stable with no sign of phase separation and no change in color. The cream was prepared by using the cream base that is Bees wax, Propylene Glycol, Cetyl Alcohol, Stearic Acid, Methyl paraben, Vitamin-E, With Oils like Argon oil, Jojoba oil, Almond oil, Olive oil, Grape Seed oil. We have developed three batches of our herbal cream, namely F1, F2, and F3. All three batches were evaluated for different parameters like appearance, pH, viscosity, washability, spreadability, Rancidity, Extrudability, All the three formulations F1, F2 and F3 showed good appearance, pH, viscosity, washability, spreadability and Rancidity, Extrudability was observed. All the three formulations were stable at room temperature. Green tea (*Camellia sinensis*) It is used in cosmetic preparation can protect the skin from UV damage and aging of the skin. Catechin compounds contained in green tea are polyphenol substances. The polyphenols are secondary metabolite of plants and are generally involved in defense against UV radiations, also in protecting skin.

**Keywords:** Green tea, Argon oil, Jojoba oil, Almond oil, Grape seed oil, Olive oil

## INTRODUCTION

The word "cosmetics" arises from the Greek word "cosmetics" which means to adorn. Materials used to enhance their beauty are known as cosmetics. The methods are implementing to improve beauty from past olden days. Cosmetics are the products, maintains contact with outer parts of the body without causing any harmful effect. Also, maintain good texture and appearance to the skin and protects from UV rays. Cosmetics are used for removing dirt and maintaining good appearance without disturbing our body functions. All skin creams, lotions, shampoos come under cosmetic products only.

Cosmetics are prepared and used to improve the beauty. For various types of skin ailments formulation like skin protective, sunscreen, anti-acne, anti-wrinkle, moisturizing, either natural or synthetic. The development process for cosmetic formulation needs maintenance of quality standards. Creams are defined as the "a semisolid dosage form containing one or more drug substances dissolved or dispersed in a suitable base intended for external application of the skin". They are formulated using hydrophilic or

hydrophobic bases to provide preparations that are essentially miscible with skin secretion. They are semisolids usually consisting of solutions or dispersions of one or more medicaments in suitable bases. Creams are semisolid emulsions which contain mixture of oil and water. Their consistency varies between solids and liquids. With help of additives such as emulsifying agent and newer techniques, the preparation of cream becomes easy. The aim of the present work is to formulate and evaluate a multipurpose cream containing extract from plant *Camellia sinensis* and evaluated multipurpose herbal cream containing argan oil, jojoba oil, olive oil, almond oil, grape seed oil some of the basic oils used to make the cream. Reduces puffiness and under-eye circles. Improves complexion and skin tone. Treats dry skin. Improves acne. Helps reverse sun damage. Reduces the appearance of scars. Reduces the appearance of stretch marks.

### **USES OF JOJOBA OIL:**

Jojoba is applied directly to the skin for acne, psoriasis, sunburn, and chapped skin.

1. Deeply Hydrating: It is lighter than other face oils and easily absorbed into skin. It deeply penetrates to soothe and soften while providing an excellent moisturizing effect and adding a healthy glow.
2. Long-Lasting Moisturization: It doesn't evaporate like water-based moisturizers, which is very important when your skin is exposed to the environment. Studies have shown that Jojoba Oil provides a substantial long-acting layer of moisture.
3. Nutritious for Skin: Jojoba is full of nutrients like Vitamin E and B, as well as antioxidants and minerals like chromium, copper, and zinc, which all nourish and protect skin. Organic, cold-pressed, Jojoba Oil has the highest level of antioxidants and nutrients.

### **USES OF OLIVE OIL:**

Olive oil penetrates deep into the skin to provide a long-lasting shield of moisture that keeps skin nourished all night long. Olive oil also contains essential fatty acids that replenish dry skin, leaving it smooth and supple. Restore your skin as you sleep and wake up with a silky smooth complexion.

### **USES OF ARGAN OIL:**

Make-up remover. Protect skin from sun damage. As a moisturiser. Treating cuticles (rub a small amount of oil into your cuticles to keep them from snagging) Treating acne. Anti-aging. A treatment for stretch marks.

### **USES OF GRAPESEED OIL:**

Grape seed oil lightens skin discolorations like acne scars and sunspots. improve your skin's elasticity and softness. Research has shown Trusted Source that the herbal ingredient did improve skin's moisture softness stability to bounce back.

### **Methylparaben:**

Methyl paraben is widely used as an anti-microbial preservative in cosmetics, food product and pharmaceutical formulations.

### **Cetyl Alcohol:**

Cetyl alcohol is used in the cosmetic industry as an opacifier in shampoos, or as an emollient, emulsifier or thickening agent in the manufacture of skin creams and lotions and also lubricants. It can also be used as a non-ionic co-surfactant in emulsion applications.

**Propylene Glycol:**

Propylene glycol has become widely used as a solvent, extracutant and preservative in a variety of parenteral and non-parenteral pharmaceutical formulation. As an antiseptic it is similar to ethanol and against molds it is similar to glycerin and only slightly less effective than ethanol. Propylene glycol is commonly used as a plasticizer in aqueous film-coating formulations. Propylene glycol is also used in cosmetics and in the food industry.

**Ethanol:**

Ethanol is used in medical wipes and most common anti-bacterial hand sanitizer gel as an antiseptic. Ethanol, often in high concentrations, used to dissolve many water-insoluble medications and related compounds. Ethanol is used as a disinfectant in lab and hospital preservatives for biological specimens. Ethanol used in the manufacture of perfumes and pharmaceuticals products.

**TYPES OF CREAMS:****1. Oil Creams:**

- Oil in water creams which are composed of small droplets of oil dispersed in a continuous phase.
- More comfortable and cosmetically acceptable as they are less greasy and more easily washable off using water.
- Emulsifying agents of natural origins (bees wax, wool alcohols, wool fat)
- Emollient and creamy, white or translucent and stiff.

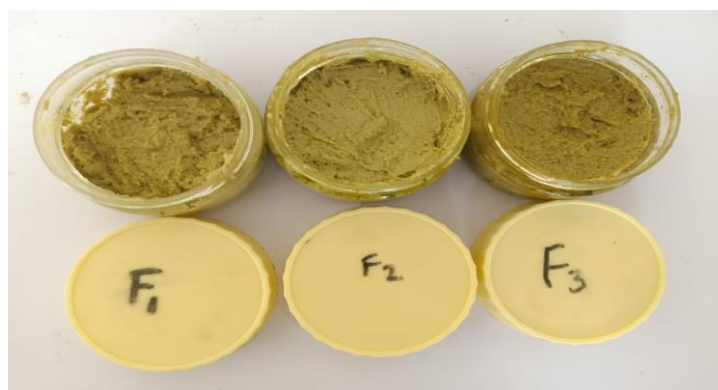
**2. Aqueous creams:**

Water in oil(w/o) creams which are composed of small droplets of water dispersed in continuously oily phase. More difficult to handle but many drugs that are incorporated into the creams and will be released more readily from W/O cream than the O/W cream.

**MULTIPURPOSE CREAM<sup>3</sup>:-**

Multipurpose Cream is a light, non greasy, daily-use cream, which provides you all day moisturizing, nourishment and protection. Blended with natural herbal extracts Multipurpose Skin Cream protects your skin from pollution and dry weather and provide nourishment and moisture. As enriched with super antioxidants, it can boost radiance for a luminous and fresh complexion.

The main aim of our work is to develop an cosmetic cream which can give multipurpose effect like moisturizing, anti-oxidant, anti-aging and also acts as sunscreen. In this we have used green tea as a herbal extract, fixed oils in our preparation which are argan oil, jojoba oil, almond oil, olive oil & grape seed oil<sup>4</sup>.



**Formulation of multipurpose cream**

**Moisturizers:** -Moisturizers improves skin hydration and increases stratum corneum water content by directly providing water to the skin from their water phase and increasing occlusion to reduce trans-epidermal water loss, it also covers small skin fissures, provides a soothing protective film and protects skin from friction.

**Anti-oxidants:** -Antioxidants protect skin cells against the damaging effects of reactive oxygen species (ROS), such as singlet oxygen, superoxide, peroxy radicals, hydroxyl radicals, and peroxynitrite. ROS induced oxidative stress in the skin has been linked to cancer, aging, inflammation, and Photodamage.

**Anti-Aging:** -It may reduce signs of aging and skin discoloration. And it can have a calming effect on the skin, making your skin more able to benefit from other ingredients in your cream.

**Sun protection factor (SPF):** Reduce the Signs of Aging, Limit the Appearance of Sunspots, Protect the Skin from Sunburn, reduce the risk of Skin Cancer.

### GREEN TEA<sup>5</sup>:

Green Tea leaf<sup>5</sup> (*Camellia sinensis*) It is used in cosmetic preparation can protect the skin from UV damage and aging of the skin. Catechin compounds contained in green tea are polyphenol substances. The poly phenols are secondary metabolite of plants and are generally involved in defense against UV radiations, also in protecting skin.

- The catechin compounds found in green tea are 2-epicatechin (EC), (2)-EC3-gallate and epigallocatechin (EGCG). EGCG is the main polyphenol contained in green tea which has anti-inflammatory and antioxidant function.
- Green tea leaves are potential antioxidants with IC 50 of 3.17micro gram/ml.
- These antioxidant compounds are used as active ingredients in the formulation of sunscreen. Its UV protection factor efficacy and potent antioxidant activity are resulting synergistic effect in photoaging protection.

A cream preparation is an effort to increase the usage of green tea. Cream is very suitable for skin care because it is easy to use soothing, moisturizing and easy to penetrate the skin so as to provide the desired effect in healing. Cream of green leaf extract<sup>5</sup> with addition of 1% of vitamin C has a higher antioxidant activity compared to green tea leaf extract cream with addition of 1% vitamin E<sup>5</sup>.

### Green Tea Plant Profile<sup>5</sup>:



**Kingdom:** Plantae

**Order:** Ericales

**Family:** Theaceae

**Genus:** Camilla L

**Species:** C sinensis

**Synonym:** Camellia thea Link, CemellaoleosaLour

**Biological Source:** Leaves, Buds and tender, shrubs

of *Camellia sinensis*, Family Theaceae

**Geographical Source:** *Camellia sinensis* var. *sinensis* is probably native to western Yunnan, while *C. sinensis* var. *sinensis* is native to Assam, Burma, Thailand, Laos, Cambodia, Vietnam and southern China. 'Wild' tea plants can be found growing in forests, but these may be relics of past cultivation. It is also found in some country Africa, Asia, Australia, Bangladesh, Brazil, Burundi, Cambodia, Caucasus, China, Himalayas, India, Indonesia, Japan, Kenya, Korea, Malaysia, Myanmar, Nepal, SE Asia, Srilanka

**Life Cycle:** Perennial

**Botanical Description:** The *Camellia sinensis* L. is a plant of the family and *Camellia* genus, it is commonly known as "Tea" or "Cha", evergreen shrubs, 1-3m tall; shoots, tender leaves pilose. Tea plant is an evergreen shrub with large number of branches. The leaves appear glossy dark green, elongate ovate, roughly serrate, coriaceous, alternate and short-petiolate. While young leaves appear silver because they bear downy hairs on the surface. It has yellow-white flowers and long, serrated leaves. Flowers are axillary, solitary, or up to three in a cluster. They are 2.5-3.5 cm in diameter and have six to eight petals. The outer petals are sepaloid and the inner petals are obovate to broadly obovate. There are numerous stamens 0.8-1.3cm in length. Young leaves have short white hairs on their underside and young branches are greyish yellow and glabrous. Current year branchlets are purplish red. Terminal buds are silvery grey and sericeous. Petioles are 4-7mm in length, pubescent, and glabrescent. Leaf blades are elliptic, oblong-elliptic, or oblong. Seeds are brown, subglobose, and 1-1.4 cm in diameter. Flowering of *Camellia sinensis* occurs from October through February and fruiting occurs from August to October. Tea can be cultivated in regions with fair temperature, acidic soils and highly humid environmental conditions.

**Chemical Constituent:**

Polyphenols-37%, Carbohydrates-25%, Caffeine-15%, Protein-4%, Aminoacids-4%, Lignin-6.5%, Organicacids-1.5%, Lipids-2%, Ash-5%, Chlorophyll-0.5%.

**Therapeutic Uses:**

- Improves Mental Alertness,
- Relieving digestive symptoms, and headaches and promoting weight loss,
- May improve cognitive function,
- could help in fat burning, lowers risk of cancer,
- Helps in maintaining blood sugar level,
- Lowers Cholesterol,

**METHODS:**

**Centrifugation test:**

Prepared cream formulations were separately centrifuged in a test tube of 10 cm long and 1 cm width for 5, 15, 30 and 60 minutes with 2000 rpm and then studied for sedimentation and cream stability.

**PH Determination:**

By using the digital pH meter, pH of the cream was measured. The pH meter was calibrated with standard buffers solution before measurement and every time the measuring was repeated 3 times and the mean was calculated.

**Extrudability test:**

About 5 gm of the cream formulation was filled in a clean, lacquered aluminum collapsible tube on crimped end of the tube then clamp was applied to avoid any rollback and the cap was removed and

cream was extruded. The extrudability was then determined by measuring the amount of cream extruded through the tip. The extruded cream was collected and weighed and the percentage of cream extruded was calculated and grades were allotted

$$\% \text{ Extrudability} = \frac{\text{Amount of cream extruded from the tube}}{\text{Total amount of cream filled in the tube}}$$

>90% Extrudability Excellent), (>80% Extrudability Good), (>70% Extrudability: Fair)



**Viscosity:** Viscosity of formulated cream was determined by using Brookfield viscometer. The creams were rotated at 50 rpm using spindle no.64. At each speed, the reading was recorded. The viscosity determination of samples was repeated three times. Viscosity Determination of Multipurpose cream.



**Spreadability :**

Spreadability was determined by the apparatus which consists of a glass plate block, which was provided by a pulley at one end. By this method Spreadability was measured on the basis of slip and drag characteristics of creams. An excess of cream (about 2gm) under study was placed on this ground slide. The cream was then sandwiched between this slide and another glass slide having the dimension of fixed

ground slide the two slides for 5minutes to expel air and to provide a uniform film of the cream between the slides. Excess of the cream was scrapped off from the edges. The top plate was then subjected to pull of 20 gm. With the help of string attached to the hook and the time (in seconds) required by the top slide to cover a distance of 7.5 cm be noted. A shorter interval indicates better Spreadability. Spreadability was calculated using the following formula:

$$S=M \times L / T$$

S=Spreadability,

M=Weight tied to the upper slide,

L=Length moved by the glass slide(7.5cm)and

T=Time(insec)taken to separate the slide completely each other.



**Spreadability Determination of multipurpose cream formulation.**

## 5. RESULTS

### 5.2 In Vitro determination of sun protection factor by UV spectrophotometer

Sl.NO	wavelength(nm)	Abs			Avg.	EE*I	Abs(EE*I)
		I	II	III			
	290	1.710	1.702	1.710	1.707	0.015	0.0256
	295	1.181	1.242	1.101	1.17	0.0817	0.0953
	300	1.075	1.127	1.126	1.076	0.2874	0.3092
	305	1.035	1.075	1.985	1.031	0.3278	0.3379
	310	1.003	1.041	0.956	1.000	0.1864	0.1864
	315	1.967	1.002	0.922	0.963	0.0839	0.0807
	320	0.937	0.970	0.893	0.933	0.018	0.0167
<b>SPF=10.51</b>							$\Sigma=1.0518$

**Table04: In Vitro determination of sun protection factor by UV spectrophotometer *Camellia sinensis* (F1).**

Sl.NO	wavelength(nm)	Abs			Avg.	EE*I	Abs(EE*I)
		I	II	III			
	290	0.640	0.631	0.677	0.649	0.015	0.099
	295	0.761	0.769	0.786	0.772	0.0817	0.063
	300	0.742	0.745	0.761	0.749	0.2874	0.215
	305	0.690	0.692	0.703	0.695	0.3278	0.227
	310	0.630	0.628	0.640	0.623	0.1864	0.117
	315	0.570	0.565	0.577	0.570	0.0839	0.047
	320	0.521	0.514	0.526	0.520	0.018	0.009
<b>SPF=12.92</b>							$\Sigma=1.292$

**Table05: In Vitro determination of sun protection factor by UV Spectrophotometer *Camellia sinensis*(F2).**

Sl.NO	wavelength(nm)	Abs			Avg.	EE*I	Abs(EE*I)
		I	II	III			
1	290	0.936	0.936	0.870	0.914	0.015	0.0137
2	295	0.892	0.894	0.849	0.878	0.0817	0.0717
3	300	0.808	0.842	0.803	0.817	0.2874	0.2348
4	305	0.771	0.802	0.766	0.779	0.3278	1.1068
5	310	0.738	0.766	0.730	0.744	0.1864	0.1386
6	315	0.700	0.730	0.694	0.708	0.0839	0.0594
7	320	0.672	0.697	0.664	0.677	0.018	0.0121
<b>SPF=16.37</b>							$\Sigma=1.637$

**Table06: In Vitro determination of sun protection factor by UV spectrophotometer *Camellia sinensis* (F3).**

**Characterization of Multipurpose cream**

**Visual appearance and Homogeneity:**

All the prepared cream formulations were visually analyzed they were found to be clear & there was no aggregation found and free from presence of particles.

**Centrifugation Test:**

There was no observable sediment in centrifuge tests and the MULTIPUPOSE CREAM kept their uniformity

F1	Not Separated
F2	Not Separated
F3	Not Separated



**EVALUATIONS OF MULTIPURPOSE CREAM**

Formulation Code	pH (Mean±SD)	Extrudability in percentage (Mean±SD)	Viscosity in cps (Mean±SD)	Spreadability in g.cm/sec (Mean±SD)
F1	6.5 ± 0.52	81.8 ± 0.1	10583±0.821	44.51
F2	6.5 ± 0.32	84.4 ± 0.08	10616± 0.79	106
F3	6.6 ± 0.05	87 ± 0.09	10243 ± 0.65	205.6

**Table07: pH, Extrudability, Viscosity and Spreadability of Multipurpose cream.**

**DISCUSSION**

**Physical Parameters:**

**Visual appearance and Homogeneity:**

Formulated cream was investigated for presence of particle, improper mixing aggregation, and other residue. So prepared creams were filled in transparent container and visually inspected were all the formulations were found to be homogeneous and there was no aggregate formation of particles

**Centrifugation:**

For the study of uniformity and sedimentation of the cream, centrifuge test was carried out, on investigation there were no observable sediment and the cream kept their uniformity.

**SPF:**

The absorbance values of formulations F1 to F3 were measured using UV spectrophotometer and SPF was calculated. The results showed that F3 has highest SPF of 16.37 which may be attributed to the presence of higher concentration of both. F1 formulation showed a SPF value of 10.51 and F2 formulation of about 12.92.

**PH Determination:**

PH is an important parameter that reflects the chemical conditions of cream. For the purpose of stability and maintaining with in the range of skin pH the formulation was evaluated for its pH. All cream formulation were subjected to pH determination studies. The pH of the all cream formulations was in the range of 6.5 to 7.0 which lies in the normal pH range of the skin.

**Extrudability:**

Quantifying extrudability is important to determine the ease of removal and application of products. The various cream formulations were subjected to extrudability. The values of extrudability indicate that the cream was showed good extrudability. Among these formulations cream F1 showed excellent extrudability as compared to F2 and F3.

**Viscosity:**

Cream formulations majorly depend upon its viscosity. Viscosity of the formulation affects the drug release from the cream. If the cream contains more viscosity the drug release will be slow and the same creams possess less viscosity the drug diffuses immediately into diffusion medium. The various cream formulation were subjected to viscosity studies, all the cream formulations showed good viscosity and

they were capable to remain in the site of application for prolonged time. Among these formulations cream F2 was more viscous compared to cream F1 and F3.

#### **Spreadability:**

To determine the spreading ability of cream the test was performed. The cream having low viscosity shows better Spreadability. The values of Spreadability indicate that the cream was easily spreadable by small amount of shear.

#### **CONCLUSION**

Multipurpose cream of green tea was successfully formulated by using the green tea extract of *Camellia sinensis*. SPF of F3 formulation showed enhanced protection against UV radiation as compared to F1 and F2. The pH of the Cream formulations was in the range of 6.5 to 7.0 which lies in the normal pH range of the skin. All the cream formulations were found to be homogeneous and there was no aggregate formation, there were no observable sediment in centrifuge tests. All the Cream formulations showed good viscosity and they were capable to remain in the site of application for prolonged time. The values of Spreadability indicate that the Cream was easily spreadable by small amount of shear. All the Cream formulations showed good extrudability. Among these formulations.

#### **SUMMARY**

The aim of the present work was to formulate and evaluate Multipurpose cream containing green tea extract. Green tea were extracted from the *camellia sinensis*, by adding 96% ethanol. Multipurpose cream was prepared using propylene glycol, stearic acid, methyl paraben and distilled water as other additives. Formulated cream were evaluated for SPF, pH, viscosity, Spreadability and extrudability. The pH of the all formulations were in the range of 6.5 to 7.0. Multipurpose cream formulations were subjected to viscosity studies. All the cream formulations showed good viscosity. The values of Spreadability indicate that the cream was easily spreadable by small amount of shear. All the cream formulations showed excellent extrudability.

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