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## International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

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# Development and Assessment of Herbal Cream for Basal Cell Carcinoma

Sudeep Dhangar, Avinash Sharma, Dr. Satyaendra Shrivastava

Parijat College of Pharmacy, Indore (M.P.), India

**ABSTRACT:** Basal cell carcinoma (BCC) is the most common form of skin cancer, typically requiring surgical Intervention for treatment. In recent years, It has been observe complementary and alternative Therapies, including herbal creams, for managing BCC. Herbal creams derived from plant-based Compounds have demonstrated potential in inhibiting tumor growth, reducing inflammation, and Enhancing the skin's ability to heal. This topic explores the efficacy of herbal creams as adjunctive Treatments for BCC, focusing on key ingredients such as green tea extract, curcumin and aloe vera, Which have shown promising anticancer and antioxidant properties. While clinical evidence Remains limited, early studies suggest that these herbal compounds may offer a non-invasive, cost effective alternative or supplementary treatment option for patients with BCC. Further research And clinical trials are necessary to establish the optimal formulations, dosages, and mechanisms of Action for these herbal remedies in the context of BCC treatment.

**KEYWORDS:** Basal cell carcinoma topical herbal cream natural remedies green tea. Turmeric. Aloe vera. Ginger. Neem. Vitamin e oli.

## I. INTRODUCTION

Basal Cell Carcinoma (Bcc) is the most common form of skin cancer, originating in the basal cells, which are located in the deepest layer of the epidermis (the outermost layer of the skin). The basal cells are responsible for generating new skin cells as older ones die off. BCC occurs when these basal cells undergo mutations, typically as a result of prolonged exposure to ultraviolet (UV) radiation from the sun or tanning beds. Though BCC is usually slow-growing and rarely metastasizes (spreads to other parts of the body), it can cause significant damage to the skin and surrounding tissues if left untreated. Over time, it may form open sores, bleed, or develop into an ulcerated lesion. BCCs most often develop in areas of the body that are exposed to sunlight, such as the face, ears, neck, scalp, shoulders, and back. However, they can appear on any part of the skin. The tumor may present as a pearly, shiny nodule, a red, scaly patch, or a flat, scar-like lesion. It can sometimes be mistaken for other benign skin conditions, which is why early detection is crucial for effective treatment. In addition to sun exposure, other risk factors for BCC include a family history of skin cancer, fair skin, a weakened immune system, and certain genetic conditions, such as basal cell nevus syndrome, which increases the likelihood of developing multiple BCCs.

Treatment for basal cell carcinoma typically involves surgical excision, where the tumor is cut out, but other methods such as Mohs micrographic surgery, radiation therapy, and topical treatments (such as creams or medications) may be used, depending on the size, location, and depth of the tumor. Although BCC has a low risk of spreading, it can recur if not completely removed, making follow-up care essential after treatment. Overall, the prognosis for BCC is very favorable when detected early. Regular skin checks and sun protection are key to preventing its development and ensuring the best outcomes for individuals at risk.





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### 1. MATERIALS AND METHOD

#### 1.1 MATERIALS

##### a) List of chemical

S. No.	Name of chemical	Manufactured/supplier
1.	Green tea	( Marothia bazar) Indore
2.	Turmeric	( Marothia bazar) Indore
3.	Neem	( Marothia bazar) Indore
4.	Ginger	( Marothia bazar) Indore
5.	Aloe Vera gel	( Marothia bazar) Indore
6.	Vitamin e	( Marothia bazar) Indore
7.	Bees wax	Peckay Scientific, Indore
8.	Liquid paraben	Peckay Scientific, Indore
9.	Borax	Chemdyes Corporation, Gujarat
10.	Methylparaben	Oxford lab finechem.LLP
11.	Rose oil	Peckay Scientific, Indore
12.	Water	Paeijat college of Pharmacy, Indore

**Table No. 1 List of Chemical**



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### b) List of glassware

S. No.	Glassware name	Manufactured/supplier
1.	Beaker (50, 100,250)	Nandini enterprise
2.	Burner	Nandini enterprise
3.	Funnel	Nandini enterprise
4.	Glass slide	Unique enterprise
5.	Measuring cylinder	Nandini enterprise
6.	Pipettes	Nandini enterprise
7.	Sieve	PK scientific
8.	Spatula	Dawa bazar
9.	Stirring glass rods	Dawa bazar
10.	Test tube holder	Indian scientific
11.	Test tube stand	Nandini enterprise
12.	Test tube	Indian scientific
13.	Thermometer	PK scientific
14.	Tong	PK scientific
15.	Tripod stand	
16.	Volumetric pipettes	Nandini enterprise
17.	Wire gauge	Indian scientific
18.	Butter paper	Dawa bazar
19.	Filter paper	Indian scientific
20.	Muslin cloth	PK scientific
21.	Container	Dawa bazar

Table No. 2 List of Glassware

## 1.2 METHOD

### 1.2.1 Collection

Green tea leaves, Turmeric powder, Neem powder, Ginger powder, Aloe Vera gel, Vitamin e oil were collected from the local market. ( Marothia bazar) .

### 2.2.2 Preparation of extracts

After collection of the herbal drugs. A desired quantities of herbal drugs were weight and each herb macerated in a beaker with the help of solvent and kept separately for 2 days.

### 2.2.3 Filtration

After 2 days, macerated herbs filtrated out by using simple filtration method. Filtration of extract was done by using simple filter paper and funnel for two times.

## ❖ DRUGS PROFILE

### 1. Green tea

- ✓ **Botanical Name:** Camellia sinensis .
- ✓ **Family:** Theaceae .



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- ✓ **Synonyms:** *Thea sinensis*, *C. thea*.
- ✓ **Biological Source:** Leaves and leaf buds of *Camellia sinensis*.
- ✓ **Geographical Source:** Primarily China and Japan.
- ✓ **Chemical Constituents:** Catechins, particularly epigallocatechin-3-gallate (EGCG), being the most prominent and active polyphenols. Other key components include caffeine, theanine, amino acids, minerals.
- ✓ **Medicinal uses of green tea:** Green tea, rich in antioxidants like catechins, is linked to various health benefits, including potentially supporting cognitive function, aiding in weight management, and potentially reducing the risk of heart disease and certain cancers.



Fig. no. 1 Green tea leaves

### 2. Turmeric

- ✓ **Botanical Name:** *Curcuma longa* and *Curcuma aromatica* Family: Zingiberaceae.
- ✓ **Synonyms:** Haldi, manjal, Indian saffron curcuma.
- ✓ **Biological Source:** It is a dried rhizomes of *Curcuma Longa*.
- ✓ **Geographical Source:** Turmeric thrives in rainy tropical areas such as the Indian subcontinent Long Southeast Asias.
- ✓ **Chemical Constituents:** Turmeric powder is about 60-70% carbohydrates 6-13% water, 6-8% proteins, 5-10% fat, 3-7% dietary mineral, 3-7% essential oils, 2-7% dietary fibre, 1-6% curcuminoids. Phytoconstituents of turmeric include diarylheptanoids, a class including numerous curcuminoids –Curcumin, demethoxycurcumin, and bisdemethoxycurcumin.
- ✓ **Medicinal uses of Turmeric :** When applied topically to aseptic and septic wounds, it seems to have good Promise as a wound healing powder. Additionally, it is used to prevent, treat, or manage psoriasis as well As other skin disorders .



Fig. no. 2 Turmeric powder

### 3. Neem (Azadirachta Indica)

- ✓ **Botanical Name:** *Azadirachta Indica*
- ✓ **Family:** Meliaceae
- ✓ **Synonyms:** Neem
- ✓ **Biological Source:** Fresh or dried leaves and seed oil of *Azadirachta Indica*.
- ✓ **Geographical Source:** It is one of two species in the genus *Azadirachta*, and is native to the I India Subcontinent. It is typically grown in tropical and semi-tropical regions. Neem trees also grow on islands in Southern Iran.
- ✓ **Chemical Constituents:** Natural compounds present in Neem are Triterpenes or Limonoids Azadirachtin,



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Salannin, meliantriol and nimbin are well known the bitter constituents The nimbin contains an acetoxy, a Lactone, an ester, a methoxy and an aldehyde group.

- ✓ **Medicinal uses of Neem:** Acne treatment, Oral, skin and hair care, Anti-wrinkle and anti- aging, Skin Disorders, Dermatitis prevention, Skin whitening. such acne, burns, eczema,



Fig. no.3 Neem powder

### 4. Ginger

- ✓ **Botanical Name:** Zingiber officinale .
- ✓ **Family:** Zingiberaceae (Ginger Family) .
- ✓ **Synonyms:** Rhizoma zingiberis, Zingibere, Ginger Officinale .
- ✓ **Biological Source:** Rhizome (underground stem) .
- ✓ **Geographical Source:** Native to Southeast Asia .
- ✓ **Chemical constituents:** Gingerols and shogaols.
- ✓ **Medicinal uses:** Medicinal uses, including aiding digestion, relieving nausea, reducing inflammation, conditions like arthritis and migraines. Anti Inflammatory.



Fig. no. 4 Ginger powder

### 5. Aloe Vera

- ✓ **Botanical Name:** Aloe barbadensis Miller .
- ✓ **Family:** Xanthorrhoeaceae (formerly Liliaceae) .
- ✓ **Synonyms:** Aloe vera .
- ✓ **Biological Source:** Fresh juice collected from the bases of the leaves.
- ✓ **Geographical Source:** Native to the Arabian Peninsula .
- ✓ **Chemical constituents:** Polysaccharides like acemannan, anthraquinones (like aloin and emodin), vitamins, minerals, enzymes, amino acids, and fatty acids.
- ✓ **Medicinal uses:** Skin conditions like burns, sunburn, and wounds.



Fig. no. 5 Aloe Vera



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### ❖ EXCIPIENTS PROFILE

#### 1. Borax

- ✓ **Chemical Name:** Borax (Sodium Tetraborate)
- ✓ **Chemical Formula:**  $\text{Na}_4\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$  (Decahydrate form)
- ✓ **Molecular Weight:** 381.37 g/mol (for decahydrate)
- ✓ **Solubility:** 3.17 g/100 g water at 25°C
- ✓ **Uses:** A preservative. emulsifying agent. Cleanser buffing agent.



Fig. no. 6 Borax

#### 2. Methyl paraben

- ✓ **Chemical Name:** Methylparaben, methyl p-hydroxybenzoate
- ✓ **Chemical Formula:**  $\text{C}_8\text{H}_8\text{O}_3$
- ✓ **Molecular formula:** 152.15 g/mol
- ✓ **Solubility:** Water solubility is inversely related to alkyl chain length.
- ✓ **Use:** preservative.



Fig. no. 7 Methyl paraben

#### 3. Liquid paraffin

- ✓ **Chemical name:** Paraffin. liquidum.
- ✓ **Chemical formula:**  $\text{C}_n\text{H}_{2n+2}$
- ✓ **Molecular weight:** 348
- ✓ **Solubility:** Chloroform, Ether.
- ✓ **Uses:** Thickeners, emulsifying agents, preservatives, antioxidants, and buffer agents.

#### 4. Bees wax .

- ✓ **Chemical name:** Cera Alba or Beeswax
- ✓ **Chemical formula:**  $\text{C}_{15}\text{H}_{31}\text{COOC}_{30}\text{H}_{61}$
- ✓ **Molecular weight:** 900 g/mol
- ✓ **Solubility:** Chloroform . Ether .Acetone



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- ✓ **Uses:** Protective Barriers .Moisture Retention .Skin Softening. Anti-inflammatory and Antibacterial Properties.

### 2.2.4 Preformulation Studies

#### ❖ Organoleptic properties

- **Appearance:** Light brown to dark brown powder with a slightly fibrous texture. The Roots are usually long, slender, and cylindrical.
- **Odor:** Characteristic earthy, slightly pungent, and musty aroma.
- **Taste:** Bitter, astringent, and slightly pungent.
- **Touch/Texture:** Root powder feels coarse or fibrous with a somewhat dry texture.

#### ❖ Phytochemical screening

1. **Test for Alkaloid Wagner's test:** About ten mg of extract was taken and few drops of Wagner's reagent (Dissolve 2 g of iodine and 6g of KI in 100 cm<sup>3</sup> of water) was added And the formation of a reddish brown precipitate indicates the presence of alkaloids.
2. **Test for Flavonoid Lead acetate test:** Ten mg of extract was taken and few drops of 10% lead acetate solution was added. Appearance of yellow colour precipitate indicates The presence of flavonoids.
3. **Test for Tannin Ferric Chloride Test:** To 5 ml of the sample, a few drops of 0.1% Ferric chloride were added. The presence of a brownish green or blue black colour indicated That the material possessed tannins.
4. **Test for Saponin Foam test:** 0.5 mg of extract was diluted with 20 ml distilled water And shaken well in a graduated cylinder for 15 min. The formation of foam to a length of 1 cm indicated the presence of saponins.
5. **Test for Carbohydrates Fehling's test:** Five ml of Fehling's solution was added to 0.5 . mg of extract and boiled in a water bath. The formation of yellow or red precipitate Indicates the presence.
6. **Test for Glycosides Glycoside test:** 0.5 mg of extract was dissolved in 1 ml of water And then aqueous NaOH solution was added. Formation of yellow colour indicates the Presence of glycosides.

#### ❖ Flow property

**1.Bulk density:** The apparent bulk density was calculated by pouring a predetermined Amount of the mix into a graduated cylinder, weighing it, and then measuring the volume.

$$BD = \text{Weight of the powder} / \text{volume of the packing.}$$

**2.Tapped density:** Tapped density was calculated by setting a graduated cylinder with a Known mass of the drug excipient mixture on top of it. The cylinder was allowed to land on A hard surface as a result of its own weight. The tapping was kept up until there was no Longer any loudness change

$$TD = \text{Weight of the powder} / \text{volume of the tapped packing.}$$

**3. Angle of Repose:** Angle of repose: Angle of repose: The funnel method was used to calculate the angle of Repose. The carefully weighed mixture was poured into a funnel. The funnel's height has Been modified so that the tip barely brushes the top of the heap or head of blend. The mixture Of drug excipients was permitted to freely flow down the funnel and onto the surface. The Powder cone's diameter was measured. The following equation was used to get the Angle of repose:  $\tan \theta = h/r$   $\theta = \tan^{-1} h/r$  Where h is the height of the newly generated powder heap and r is its radius. A weighed Amount of the mixture was poured into a graduated cylinder, and the volume and apparent Bulk density were measured.

**4. Hausner's Ratio:** It measures the drug's flow characteristic. Hausner's Ratio = Tapped Density/ Bulk density.

**5. Compressibility Index:** Carr's compressibility index was used to calculate the blends' Compressibility indices. Compressibility index (%) =  $(TD - BD) \times 100 / TD$  .





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**6. Loss on drying at 105°C:** 10g of sample was placed in tarred evaporating dish. It was Dried at 105°C for 5 hours in hot air oven and weighed. The drying was continued until Difference between two successive weights was not more than 0.01 after cooling in Desiccator. Percentage of moisture was calculated with reference to weight of the sample.

**7. Total Ash:** 2g of sample was incinerated in a tared platinum crucible at temperature not exceeding 450°C until carbon free ash is obtained. Percentage of ash was calculated with Reference to weight of the subsample.

### III. METHOD OF PREPARATION

Extraction Of Herbal Drugs - The extraction was done by cold maceration process. First, the powdered plant material of Green tea leaves, Turmeric powder, Neem powder, Ginger powder, was macerated by decoction method. After 24 hours, the solvent were subjected filtration and then extracts of were collected. Preparation Of herbal cream formulation 1.Take the liquid paraffin and beeswax in a Borosilicate glass beaker at 750C And Maintain that heating temperature (Oil Phase). 2. In other beaker, dissolve borax and Propyl paraben in distilled water by Maintaining temperature 750C with water Bath. Stir the solution with glass rod Until all Solid particles gets dissolved (Aqueous Phase). 3. Then gently add heated aqueous Phase in heated oily phase with continue Starring. 4. After mixing both phases, immediately add Green tea. Aloe vera gel, Vitamin E oil. Neem extract and Turmeric. Ginger. Extract into it with continue mixing by Glass Rod until it will forms a smooth cream. 5. When the cream is formed, then add Rose oil as fragrance. 6. Then transfer this cream in slab and mix the Cream in geometric manner to Provide a Smooth texture and for mixing of all Ingredients properly. 7. Add few drops of distilled water if Necessary.

S. No.	Ingredients	F1	F2	F3	Uses
1	Green	1ml	0.8ml	0.5ml	Inhibit growth of cancer cells.
2	Turmeric	1ml	0.7ml	0.3ml	Antioxidant, anti-inflammatory
3	Neem	1ml	0.6ml	0.4ml	Promoting wound heading
4	Ginger	1ml	0.6ml	0.5ml	Antioxidant, anti-inflammatory.
5	Aloe Vera	2.7ml	2ml	1ml	Treating sunburns & Irritation.
6	Vitamin e	0.8ml	0.7ml	0.5ml	Protecting against UV damage.
7	Beeswax	3g	3.5g	3.2g	Emulsifier, stabilizer, thickener.
8	Liquid paraffin	15ml	10ml	12ml	Lubricating agent.
9	Borax	0.2g	0.4g	0.3g	Emulsifying agent & form soap.
10	Propyl paraben	0.2g	0.3g	0.4g	Preservatives.
11	Water	Q. S.	Q. S.	Q. S.	Vehicle.
12	Rose oil	Q. S.	Q. S.	Q. S.	Fragrance

Table No. 3 Formulation Table



Figure No. 8 Developed Cream Formulation (F1,F2,F3)



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### 3.1 EVALUATION OF CREAM

- 1. Physical evaluation :** In this test, the cream was observed for color, odor, texture, state.
- 2. Irritancy :** Mark the area (1 cm<sup>2</sup>) on the left-hand dorsal surface. Then the Cream was applied to that area and the time was noted. Then it is Checked for irritancy, erythema, and erythema any for an interval up To 24 h and reported.
- 3. Wash ability :** A small amount of cream was applied on the hand and it is then Washed with tap water.
- 4. PH:** 0.5 g cream was taken and dispersed in 50 ml distilled water and Then PH was measured by using digital PH meter.
- 5. Phase separation:** Prepared cream was kept in a closed container at a temperature of 25-100 °C away from light. Then phase separation was checked for 24 h for 30 d. Any change in the phase separation was Observed/checked.
- 6. Greasiness:** Here the cream was applied on the skin surface in the form of smear And checked if the smear was oily or grease-like. According to the Results, we can say that all three formulations were non-greasy
- 7. Spread ability :** The spreadability was expressed in terms of time in seconds taken By two slides to slip off from the cream, placed in between the slides, Under certain load. Lesser the time taken for separation of the two Slides better the spreadability. Two sets of glass slides of standard Dimension were taken. Then one slide of suitable dimension was Taken and the cream formulation was placed on that slide. Then Other slide was placed on the top of the formulation. Then a weight Or certain load was placed on the upper slide so that the cream Between the two slides was pressed uniformly to form a thin layer. Then the weight was removed and excess of formulation adhering to The slides was scrapped off. The upper slide was allowed to slip off Freely by the force of weight tied to it. The time taken by the upper Slide to slip off was noted.

$$\text{Spread ability} = m \times l/t$$

Where,

M= Standard weight which is tied to or placed over the upper slide(30g).

L= length of a glass slide (5 cm).

- 7. Stability Study:** Stability testing is done for the formulation batches conducted for various conditions like nature, Texture, colour, odour, etc for definite period of time and check the stability of the cream.

### IV. RESULT AND DISCUSSION

#### 1. Physical appearance/visual inspection:

Parameters	F1	F2	F3
Colour	Yellowish white	Yellowish white	Yellowish white
Odour	Characteristics	Characteristics	Characteristics
Texture	Smooth	Smooth	Smooth
Sate	Semi solid	Semi solid	Semi solid

Table no. 4 Physical appearance

- 2. Irritancy test:** The formulated cream does not cause any type of irritancy, erythema, and edema in an interval up to 24 hrs And reported. The picture showing result after 24 hours.



Figure No. 9 Irritancy Test



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3. **Washability Study:** Washability test was carried out by applying a small amount of cream on the hand and then washing with The help of tap water. Formulation were easily washable.



Figure No. 10 Washability Test

4. PH :

Parameters	F1	F2	F3
PH	6.92	7.1	5.55

Table No. 5 Ph

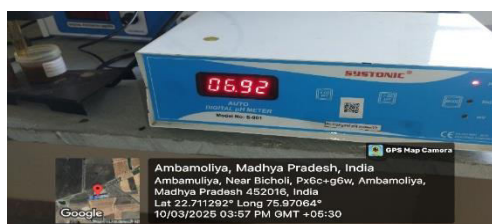


Figure No. 11 Ph Of Herbal Cream

5. Phase Separation

6.

Formulation	Observation	Inference
F1	No phase separation	Stable
F2	No phase separation	Stable
F3	No phase separation	Stable

Table No. 6 Phase Separation

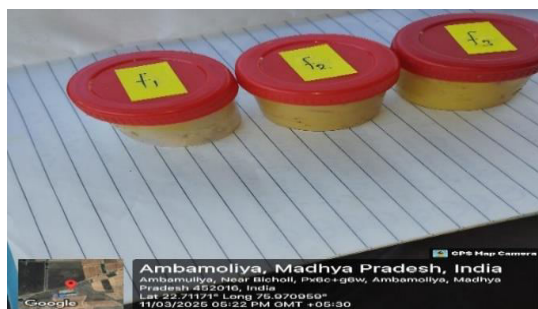


Figure no. 12 No Phase Separation



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### 7. Greasiness:

Formulation	Greasiness
F1	Non-greasy
F2	Non-greasy
F3	Non-greasy

Table no. 7 Greasiness

### 8. Spreadability:

S. No.	Formulation	Time (sec)	Spread ability (g×cm/sec)
1	F1	10	22.8
2	F2	7	32.4
3	F3	15	15.18

Table no. 8 Spreadability test

### 9. Stability Test:

S. No.	Formulation	Stability
1	F1	No phase separation
2	F2	No phase separation
3	F3	No phase separation

Table no. 9 Stability Test



Figure no. 13 Stability Test

## V. CONCLUSION

The herbal drug cream formulation, incorporating ingredients such as green tea, turmeric, neem, ginger, aloe vera, and vitamin E oil, offers a promising complementary approach to the management of basal cell carcinoma (BCC). These ingredients are rich in anti-cancer, anti-inflammatory, antioxidant, and skin-healing properties, which could help support skin recovery, reduce inflammation, and protect against further skin damage. While these herbs show potential in alleviating symptoms and promoting healing, further clinical research is required to confirm their efficacy in treating BCC. Nonetheless, this combination of natural compounds presents a holistic approach to supporting skin health and may enhance the outcomes of conventional BCC treatments.

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