

## FORMULATION AND OPTIMIZATION OFF HERBAL PEEL-OFF MASK

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### ABSTRACT

Herbal peel-off masks, derived from plant extracts, form a thin film on the skin that is removed after drying to deliver cleansing, moisturizing, and protective effects without stripping natural oils. Rich in phytochemicals, they are particularly suitable for acne, eczema, and psoriasis, offering soothing, antioxidant, and antimicrobial benefits. In this study, formulations containing *Clitoria ternatea* and *Aloe barbadensis* were prepared and evaluated for physicochemical properties, antioxidant activity, and antimicrobial efficacy. Optimization using Design Expert Software (version 13) balanced polymers, actives, and excipients to achieve stable masks with uniform film formation and enhanced bioactivity. Antioxidant potential was confirmed by DPPH assay, with formulation F8 showing the strongest activity and significant differences (\*\*p < 0.001 vs. control). Antimicrobial testing revealed inhibition zones up to 19 mm. Overall, F8 emerged as the optimized peel-off mask, combining stability with superior antioxidant and antibacterial properties.

Keywords: *Clitoria ternatea*, *Aloe barbadensis*, DPPH assay, Design Expert Software(DOE), Optimization.

### INTRODUCTION

Herbal peel-off masks form a thin film on the skin, removed after drying to provide immediate cleansing and rejuvenation. Unlike rinse-off masks, they adhere to the skin, eliminating impurities, dead cells, and excess oil while preserving the moisture barrier. Phytochemicals such as flavonoids, phenolics, and polysaccharides impart antioxidant, antimicrobial, and soothing effects, making them suitable for sensitive and acne-prone skin. *Clitoria ternatea* (butterfly pea flower) contributes anthocyanins and flavonoids with strong antioxidant activity, while *Aloe barbadensis* (aloe vera) offers moisturizing, anti-inflammatory, and antimicrobial benefits. Their combination provides synergistic potential for skin health. Optimization using Design Expert Software (version 13) balanced key parameters-viscosity, drying time, peel strength, and spreadability to ensure uniform film formation, hydration, and stability. This study integrates traditional herbal knowledge with modern cosmetic science to establish a validated peel-off mask formulation that delivers therapeutic benefits and meets consumer expectations.

### LIST OF MATERIALS

**Table No:1: List of materials used for the preparation of the formulation**

| Sl. No | List of materials                | Role               |
|--------|----------------------------------|--------------------|
| 1      | Clitoria ternatea flower extract | Antioxidant        |
| 2      | Aloe Vera extract                | Antimicrobial      |
| 3      | HPMC K 15                        | Gelling agent      |
| 4      | Polyvinyl alcohol                | Film forming agent |
| 5      | Sodium benzoate                  | Preservative       |
| 6      | Glycerin                         | Moisturizer        |
| 7      | Distilled water                  | Vehicle            |

### EXTRACTION OF CLITORIA TERNATEA POWDER

Fresh clitoriaternata flower was collected,dried and crushed. The powder weighed, soaked in distilled water for 15-30minutes, and heated at 60-70 °C for 30-45 minutes with occasional stirring. The mixture



was cooled, filtered through muslin cloth, and left overnight. The clear blue filtrate was collected.

**Fig No:1:Extract Of*Clitoriaternatea***

### EXTRACTION OF ALOE VERA GEL

Fresh aloe vera leaves were washed, drained vertically for 10–15 minutes to remove latex, and trimmed to discard spiny edges and rind. The inner gel was scooped, homogenized, filtered through muslin



cloth, and stored in an airtight container.

**Fig No:2:Aloe Vera Gel**

### FORMULATION TABLE

**Table No:2:Formulation chart of herbal peel off mask**

| Ingredient | Clitoriaternatea powder extract | Aloe vera gel | HPMC K15 | Sodium benzoate | PVA  | Glycerine | Distilled water |
|------------|---------------------------------|---------------|----------|-----------------|------|-----------|-----------------|
| F1         | 4.7ml                           | 3.5g          | 0.26g    | 0.04g           | 0.5g | 1.0ml     | 10ml            |
| F2         | 4.3ml                           | 3.8g          | 0.36g    | 0.04g           | 0.5g | 1.0ml     | 10ml            |
| F3         | 4.0ml                           | 4.0g          | 0.46g    | 0.04g           | 0.5g | 1.0ml     | 10ml            |
| F4         | 3.6ml                           | 4.3g          | 0.56g    | 0.04g           | 0.5g | 1.0ml     | 10ml            |
| F5         | 4.3ml                           | 3.5g          | 0.66g    | 0.04g           | 0.5g | 1.0ml     | 10ml            |
| F6         | 5.0ml                           | 3.4g          | 0.2g     | 0.04g           | 0.5g | 1.0ml     | 10ml            |
| F7         | 3.2ml                           | 4.4g          | 0.86g    | 0.04g           | 0.5g | 1.0ml     | 10ml            |
| F8         | 3.9ml                           | 3.8g          | 0.76g    | 0.04g           | 0.5g | 1.0ml     | 10ml            |
| F9         | 3.0ml                           | 4.9g          | 0.56g    | 0.04g           | 0.5g | 1.0ml     | 10ml            |
| F10        | 4.5ml                           | 3.7g          | 0.26g    | 0.04g           | 0.5g | 1.0ml     | 10ml            |
| F11        | 4.80ml                          | 3.4g          | 0.26g    | 0.04g           | 0.5g | 1.0ml     | 10ml            |
| F12        | 3.5g                            | 4.5g          | 0.46g    | 0.04g           | 0.5g | 1.0ml     | 10ml            |
| F13        | 4.0ml                           | 3.8g          | 0.66g    | 0.04g           | 0.5g | 1.0ml     | 10ml            |
| F14        | 2.50ml                          | 5.2g          | 0.76g    | 0.04g           | 0.5g | 1.0ml     | 10ml            |
| F15        | 5.00ml                          | 2.5g          | 0.96g    | 0.04g           | 0.5g | 1.0ml     | 10ml            |

|     |        |      |       |       |      |       |      |
|-----|--------|------|-------|-------|------|-------|------|
| F16 | 3.20ml | 4.2g | 1.06g | 0.04g | 0.5g | 1.0ml | 10ml |
| F17 | 4.40ml | 3.5g | 0.56g | 0.04g | 0.5g | 1.0ml | 10ml |

### EXPERIMENTAL DESIGN

Optimization is the processing of adjusting variables to achieve the most desirable outcome. In cosmetics, it ensures that a product is not only effective but also safe, stable, and pleasant to use.

### BOX-BEHNKEN

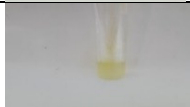
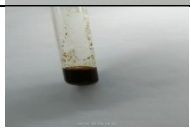
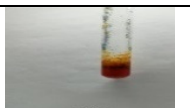
Box-Behnken Design is statistical tool under Response Surface Methodology (RSM). It is widely used in pharmaceutical and cosmetic research for optimization because it requires fewer experiments compared to full factorial designs. BBD generates combinations of factor levels.

**Table No:3: Observed Values Of Responses**

|     |     | Factor1               | Factor2     | Factor3                      | Response 1  | Response 2    | Response3            |
|-----|-----|-----------------------|-------------|------------------------------|-------------|---------------|----------------------|
| Std | Run | Polymer Concentration | Mixing Time | Herbal Extract Concentration | Drying Time | Peel Off Time | Antioxidant Activity |
|     |     | %w/w                  | min         | %w/w                         | min         | Sec           | %                    |
| 5   | 1   | 0.1                   | 15          | 1                            | 24          | 50            | 48                   |
| 4   | 2   | 0.5                   | 20          | 3                            | 22          | 56            | 42                   |
| 10  | 3   | 0.3                   | 20          | 1                            | 23          | 53            | 43                   |
| 15  | 4   | 0.3                   | 15          | 3                            | 16          | 48            | 60                   |
| 16  | 5   | 0.3                   | 15          | 3                            | 16          | 46            | 62                   |
| 6   | 6   | 0.5                   | 15          | 1                            | 19          | 58            | 64                   |
| 12  | 7   | 0.3                   | 20          | 5                            | 16          | 50            | 55                   |
| 17  | 8   | 0.3                   | 15          | 3                            | 15          | 52            | 75                   |
| 11  | 9   | 0.3                   | 10          | 5                            | 15          | 30            | 63                   |
| 14  | 10  | 0.3                   | 15          | 3                            | 18          | 52            | 61                   |
| 9   | 11  | 0.3                   | 10          | 1                            | 20          | 52            | 50                   |
| 13  | 12  | 0.3                   | 15          | 3                            | 17          | 53            | 59                   |
| 8   | 13  | 0.5                   | 15          | 5                            | 16          | 45            | 72                   |
| 3   | 14  | 0.1                   | 20          | 3                            | 24          | 55            | 47                   |
| 1   | 15  | 0.1                   | 10          | 3                            | 17          | 54            | 49                   |
| 7   | 16  | 0.1                   | 15          | 5                            | 21          | 55            | 53                   |
| 2   | 17  | 0.5                   | 10          | 3                            | 19          | 50            | 71                   |

### PHYTOCHEMICAL SCREENING

**Table No::4 Phytochemical screening**

| SL.NO | Phyto constituents | Observation                              | Inference                | Picture                                                                               |
|-------|--------------------|------------------------------------------|--------------------------|---------------------------------------------------------------------------------------|
| 1     | Anthocyanins       | Formation of green with a fading colour  | Presence of anthocyanins |  |
| 2     | Flavonoids         | Formation of yellow coloured precipitate | Presence of flavonoids   |  |
| 3     | Tannins            | A black colour is formed.                | Presence of tannins.     |  |
| 4     | Alkaloids          | An orange colour is formed.              | Presence of alkaloids.   |  |

|   |          |                           |                     |                                                                                     |
|---|----------|---------------------------|---------------------|-------------------------------------------------------------------------------------|
| 5 | Saponins | Persistent foam formation | Presence of saponin |  |
|---|----------|---------------------------|---------------------|-------------------------------------------------------------------------------------|

## RESULTS AND DISCUSSIONS

### ANOVA FOR QUADRATIC MODEL- DRYING TIME

#### Response 1: Drying Time

Table No:5: ANOVA Of Drying Time

| Source               | Sum of Squares | df | Mean Square | F-value | p-value |                 |
|----------------------|----------------|----|-------------|---------|---------|-----------------|
| <b>Model</b>         | 128.83         | 9  | 14.31       | 3.75    | 0.0475  | significant     |
| A-Polymer Con        | 12.5           | 1  | 12.5        | 3.28    | 0.1132  |                 |
| B-Mixing time        | 24.5           | 1  | 24.5        | 6.42    | 0.039   |                 |
| C-Herbal extract con | 40.5           | 1  | 40.5        | 10.62   | 0.0139  |                 |
| AB                   | 4              | 1  | 4           | 1.05    | 0.3399  |                 |
| AC                   | 0              | 1  | 0           | 0       | 1       |                 |
| BC                   | 1              | 1  | 1           | 0.2622  | 0.6244  |                 |
| A <sup>2</sup>       | 33.01          | 1  | 33.01       | 8.65    | 0.0217  |                 |
| B <sup>2</sup>       | 7.12           | 1  | 7.12        | 1.87    | 0.2142  |                 |
| C <sup>2</sup>       | 2.69           | 1  | 2.69        | 0.7065  | 0.4284  |                 |
| <b>Residual</b>      | 26.7           | 7  | 3.81        |         |         |                 |
| Lack of Fit          | 21.5           | 3  | 7.17        | 5.51    | 0.0663  | not significant |
| Pure Error           | 5.2            | 4  | 1.3         |         |         |                 |
| <b>Cor Total</b>     | 155.53         | 16 |             |         |         |                 |

|                  |       |                                |         |
|------------------|-------|--------------------------------|---------|
| <b>Std. Dev.</b> | 1.95  | <b>R<sup>2</sup></b>           | 0.9200  |
| <b>Mean</b>      | 18.71 | <b>Adjusted R<sup>2</sup></b>  | 0.8800  |
| <b>C.V. %</b>    | 10.44 | <b>Predicted R<sup>2</sup></b> | 0.8000  |
|                  |       | <b>Adeq Precision</b>          | 12.5000 |

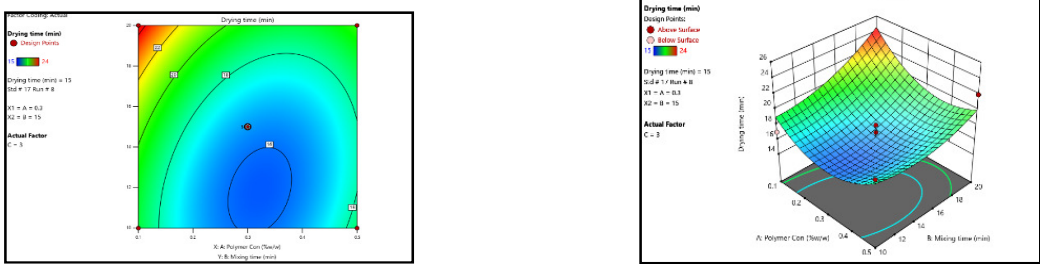
Table No:6: Fit Statistics Of Drying Time

Table No:7: Fit Summary Of Drying Time

| Source           | Sequential p-value | Lack of Fit p-value | Adjusted R <sup>2</sup> | Predicted R <sup>2</sup> |                  |
|------------------|--------------------|---------------------|-------------------------|--------------------------|------------------|
| <b>Linear</b>    | <b>0.0258</b>      | <b>0.0469</b>       | <b>0.3825</b>           | <b>0.1469</b>            | <b>Suggested</b> |
| 2FI              | 0.8746             | 0.0276              | 0.2487                  | -0.5932                  |                  |
| <b>Quadratic</b> | <b>0.0581</b>      | <b>0.0663</b>       | <b>0.8800</b>           | <b>0.8000</b>            | <b>Suggested</b> |
| Cubic            | 0.0663             |                     | 0.8663                  |                          | <b>Aliased</b>   |

Table No:8 :Lack Of Fit

| Source           | Sequential p-value | Lack of Fit p-value | Adjusted R <sup>2</sup> | Predicted R <sup>2</sup> |                  |
|------------------|--------------------|---------------------|-------------------------|--------------------------|------------------|
| <b>Linear</b>    | <b>0.0258</b>      | <b>0.0469</b>       | <b>0.3825</b>           | <b>0.1469</b>            | <b>Suggested</b> |
| 2FI              | 0.8746             | 0.0276              | 0.2487                  | -0.5932                  |                  |
| <b>Quadratic</b> | <b>0.0581</b>      | <b>0.0663</b>       | <b>0.6076</b>           | <b>-1.264</b>            | <b>Suggested</b> |
| Cubic            | 0.0663             |                     | 0.8663                  |                          | <b>Aliased</b>   |



Response 2:Peel Off Time

Table No:9: ANOVA For Peel Off Time

| Source                           | Sum of Squares | df | Mean Square | F-value | p-value |                 |
|----------------------------------|----------------|----|-------------|---------|---------|-----------------|
| Model                            | 538.69         | 9  | 59.85       | 4.3     | 0.0339  | Significant     |
| Fig No:3: Contour Of Drying Time |                |    |             |         |         |                 |
| B-Mixing time                    | 98             | 1  | 98          | 7.05    | 0.0129  |                 |
| C-Herbal extract con             | 136.12         | 1  | 136.12      | 9.77    | 0.0167  |                 |
| AB                               | 6.25           | 1  | 6.25        | 0.4485  | 0.5245  |                 |
| AC                               | 81             | 1  | 81          | 5.81    | 0.0467  |                 |
| BC                               | 90.25          | 1  | 90.25       | 6.48    | 0.0384  |                 |
| A <sup>2</sup>                   | 91.04          | 1  | 91.04       | 6.53    | 0.0378  |                 |
| B <sup>2</sup>                   | 5.09           | 1  | 5.09        | 0.3656  | 0.5645  |                 |
| C <sup>2</sup>                   | 34.2           | 1  | 34.2        | 2.45    | 0.1612  |                 |
| Residual                         | 97.55          | 7  | 13.94       |         |         |                 |
| Lack of Fit                      | 60.75          | 3  | 20.25       | 2.2     | 0.2305  | not significant |
| Pure Error                       | 36.8           | 4  | 9.2         |         |         |                 |
| Cor Total                        | 636.24         | 16 |             |         |         |                 |

|           |       |                          |         |
|-----------|-------|--------------------------|---------|
| Std. Dev. | 3.73  | R <sup>2</sup>           | 0.9000  |
| Mean      | 50.53 | Adjusted R <sup>2</sup>  | 0.8725  |
| C.V. %    | 7.39  | Predicted R <sup>2</sup> | 0.7810  |
|           |       | Adeq Precision           | 10.8462 |

Table No:10: Fit Statistics Of Peel Off Time

Table No:11: Lack Of Fit Of Peel Off Time

| Source     | Sum of Squares | df | Mean Square | F-value | p-value |           |
|------------|----------------|----|-------------|---------|---------|-----------|
| Linear     | 362.19         | 9  | 40.24       | 4.37    | 0.0845  |           |
| 2FI        | 184.69         | 6  | 30.78       | 3.35    | 0.1312  |           |
| Quadratic  | 60.75          | 3  | 20.25       | 2.2     | 0.2305  | Suggested |
| Cubic      | 0              | 0  |             |         |         | Aliased   |
| Pure Error | 36.8           | 4  | 9.2         |         |         |           |

Table No:12:Fit Summary Of Peel Off Time

| Source           | Sequential p-value | Lack of Fit pvalue | Adjusted R <sup>2</sup> | Predicted R <sup>2</sup> |                  |
|------------------|--------------------|--------------------|-------------------------|--------------------------|------------------|
| Linear           | 0.0986             | 0.0845             | 0.2282                  | 0.2561                   |                  |
| 2FI              | 0.1044             | 0.1312             | 0.443                   | 0.5533                   |                  |
| <b>Quadratic</b> | <b>0.1069</b>      | <b>0.2305</b>      | <b>0.8725</b>           | <b>0.7810</b>            | <b>Suggested</b> |
| Cubic            | 0.2305             |                    | 0.7686                  |                          | <b>Aliased</b>   |

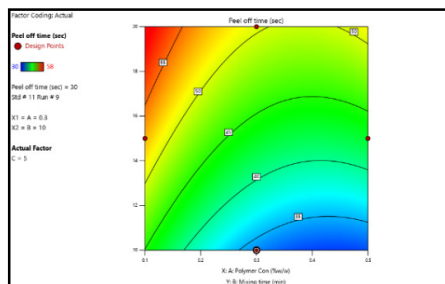


Fig No:5: Contour Of Peel Off Time

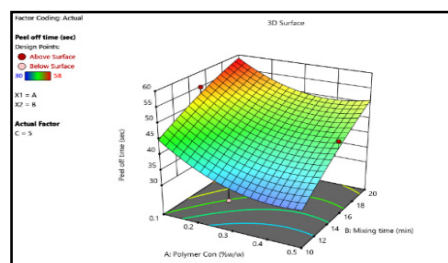


Fig No:6: 3D Surface Of Peel Off Time

## Response 3: Antioxidant Activity

| Source               | Sum of Squares | df        | Mean Square  | F-value | p-value |                 |
|----------------------|----------------|-----------|--------------|---------|---------|-----------------|
| Model                | 1353.83        | 9         | 150.43       | 3.99    | 0.0407  | significant     |
| A-Polymer Con        | 338            | 1         | 338          | 8.97    | 0.0201  |                 |
| B-Mixing time        | 264.5          | 1         | 264.5        | 7.02    | 0.033   |                 |
| C-Herbal extract con | 180.5          | 1         | 180.5        | 4.79    | 0.0648  |                 |
| AB                   | 182.25         | 1         | 182.25       | 4.84    | 0.0638  |                 |
| AC                   | 2.25           | 1         | 2.25         | 0.0597  | 0.8139  |                 |
| BC                   | 0.25           | 1         | 0.25         | 0.0066  | 0.9374  |                 |
| A <sup>2</sup>       | 22.76          | 1         | 22.76        | 0.6042  | 0.4624  |                 |
| B <sup>2</sup>       | 327.92         | 1         | 327.92       | 8.7     | 0.0214  |                 |
| C <sup>2</sup>       | 14.02          | 1         | 14.02        | 0.3723  | 0.5611  |                 |
| <b>Residual</b>      | <b>263.7</b>   | <b>7</b>  | <b>37.67</b> |         |         |                 |
| Lack of Fit          | 90.5           | 3         | 30.17        | 0.6967  | 0.6009  | not significant |
| Pure Error           | 173.2          | 4         | 43.3         |         |         |                 |
| <b>Cor Total</b>     | <b>1617.53</b> | <b>16</b> |              |         |         |                 |

Table No:13: ANOVA For Antioxidant Activity

Table No:14:Fit Statistics Of Antioxidant Activity

|                  |       |                                |         |
|------------------|-------|--------------------------------|---------|
| <b>Std. Dev.</b> | 6.14  | <b>R<sup>2</sup></b>           | 0.9200  |
| <b>Mean</b>      | 57.29 | <b>Adjusted R<sup>2</sup></b>  | 0.8915  |
| <b>C.V. %</b>    | 10.71 | <b>Predicted R<sup>2</sup></b> | 0.7684  |
|                  |       | <b>Adeq Precision</b>          | 11.8000 |

| Source           | Sum of Squares | df       | Mean Square  | F-value       | p-value       |                  |
|------------------|----------------|----------|--------------|---------------|---------------|------------------|
| <b>Linear</b>    | <b>661.33</b>  | <b>9</b> | <b>73.48</b> | <b>1.7</b>    | <b>0.3211</b> | <b>Suggested</b> |
| 2FI              | 476.58         | 6        | 79.43        | 1.83          | 0.2899        |                  |
| <b>Quadratic</b> | <b>90.5</b>    | <b>3</b> | <b>30.17</b> | <b>0.6967</b> | <b>0.6009</b> | <b>Suggested</b> |
| Cubic            | 0              | 0        |              |               |               | Aliased          |
| Pure Error       | 173.2          | 4        | 43.3         |               |               |                  |

Table No:15:Lack Of Fit Of Antioxidant Activity

Table No:16:Fit Summary Of Antioxidant Activity

| Source    | Sequential p-value | Lack of Fit p-value | AdjustedR <sup>2</sup> | PredictedR <sup>2</sup> |           |
|-----------|--------------------|---------------------|------------------------|-------------------------|-----------|
| Linear    | 0.0306             | 0.3211              | 0.365                  | 0.1344                  | Suggested |
| 2FI       | 0.454              | 0.2899              | 0.3573                 | -0.1727                 |           |
| Quadratic | 0.0819             | 0.6009              | 0.8915                 | 0.7684                  | Suggested |
| Cubic     | 0.6009             |                     | 0.5717                 |                         | Aliased   |

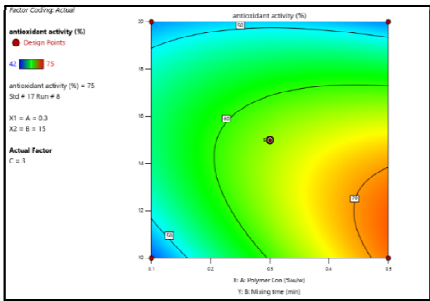


Fig No:5: Contour Of Antioxidant Activity

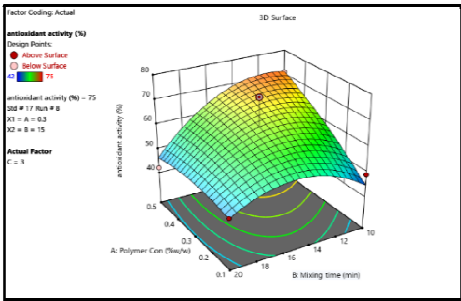


Fig No:6: 3D Surface Of Antioxidant Activity

ORGANOLEPTIC EVALUATION

Table No:17: Organoleptic evaluation

| SL.NO | PARAMETERS  | OPTIMIZED FORMULATION |
|-------|-------------|-----------------------|
| 1     | State       | Semi-solid            |
| 2     | Colour      | Blue                  |
| 3     | Odour       | Aromatic              |
| 4     | Texture     | Smooth                |
| 5     | Consistency | Good                  |

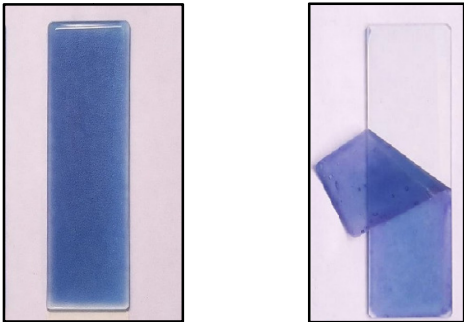


Fig No:7: Formulations Of Herbal Peel Off Mask

| Parameters    | Optimized formulation(F8) | Mean±SD        |
|---------------|---------------------------|----------------|
| pH            | Good                      | 5.28±0.02      |
| Viscosity     | Good                      | 6009±0.82(cps) |
| Drying Time   | Good                      | 20±1.0         |
| Homogeneity   | Good                      | Good           |
| Spreadability | Good                      | 5.26±0.20      |

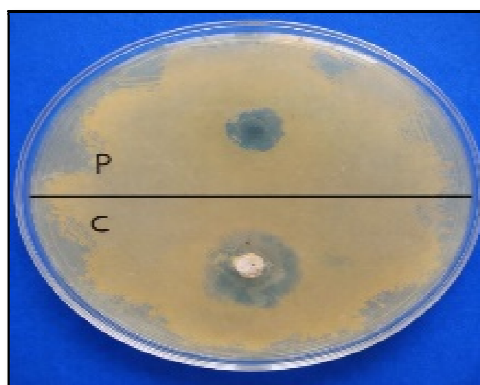
Table No:18: Evaluation Parameters Data

### ANTIMICROBIAL ACTIVITY

Antimicrobial activity was evaluated using *S.aureus* against tetracycline as control.

**Table No:19:Antimicrobial Activity**

| SL.NO | FORMULATION | ZONE OF INHIBITION(mm) |
|-------|-------------|------------------------|
| 1     | Sample      | 19.0                   |
| 2     | Control     | 24.0                   |



### ANTIOXIDANT ACTIVITY

The radical scavenging activity of different samples were determined by using DPPH assay according to *chang et al*(2001).The decrease in the absorption of the DPPH solution after the addition of an antioxidant was measured at 517nm. 1,1-diphenyl-2-picryl hydrazyl is a stable free radical with pink colour which turns yellow when scavenged. The DPPH assay uses this character to show free radical scavenging activity. Antioxidants react with DPPH and reduce it to DPPH-H and as consequence the absorbance decreases. The degree of discoloration indicates the scavenging potential of the antioxidant compounds or extracts in terms of hydrogen donating ability. All the analysis was performed in triplicates and average values were calculated. The best set of values is showed below:

**Fig No:8: Antimicrobial Activity**

| Concentrations(μL) | Absorbance | Percentage of Inhibition(%) |
|--------------------|------------|-----------------------------|
| Control            | 0.8000     | 0.0000                      |

| Standard- Ascorbic acid |        |         |
|-------------------------|--------|---------|
| 1.25                    | 0.3610 | 54.8750 |
| 2.5                     | 0.2750 | 65.6250 |
| 5                       | 0.216  | 73.0000 |
| 10                      | 0.1200 | 85.0000 |
| 20                      | 0.0710 | 91.1250 |
| Sample code-Sample      |        |         |
| 1.25                    | 0.7440 | 7.0000  |
| 2.5                     | 0.6800 | 10.5000 |
| 5                       | 0.6000 | 26.0000 |
| 10                      | 0.5040 | 37.3750 |
| 20                      | 0.4000 | 47.6250 |

Table No:20: Antioxidant Values

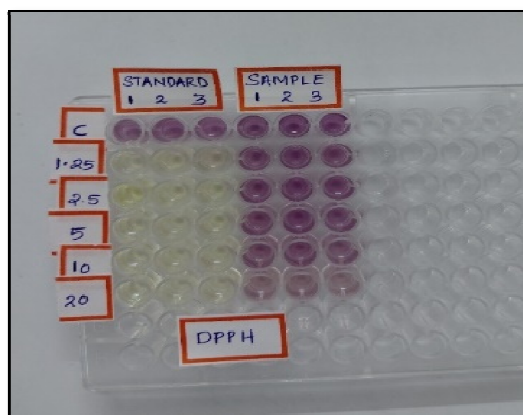


Fig No:9: DPPH Assay

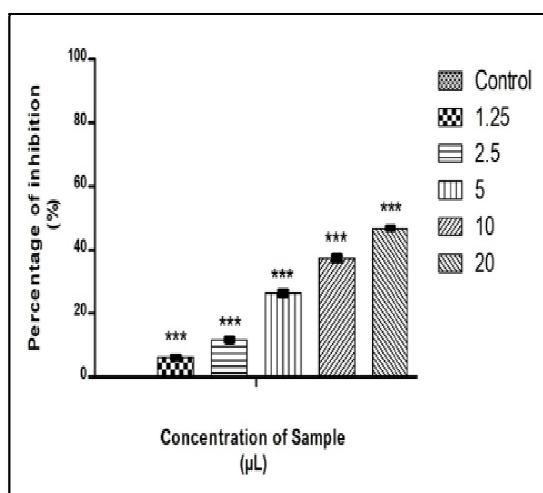


Fig No:10: Graph of Sample

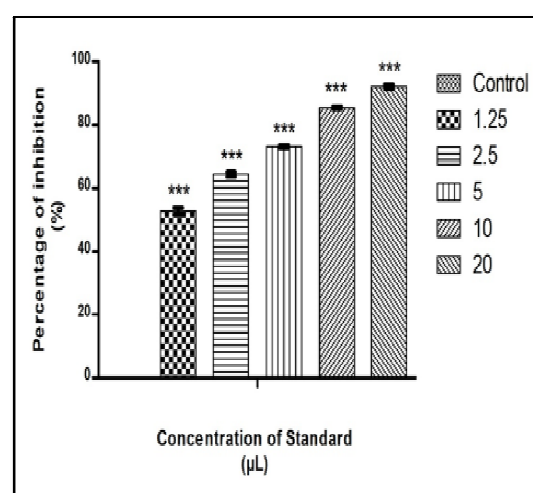


Fig No:11:Graph of Standard

## CONCLUSION

The herbal peel-off mask containing *Clitoria ternatea* peel extract and aloe vera was successfully formulated. The extract of *Clitoria ternatea* peel was prepared and incorporated with suitable excipients to obtain peel-off mask formulations of varying concentrations. The optimized formula F8 were evaluated using various parameters. Antibacterial activity was assessed by the agar plate diffusion method through the determination of the zone of inhibition. The results demonstrated that the herbal peel-off mask exhibited significant antibacterial properties. Furthermore, antioxidant activity was evaluated using DPPH assay, and the findings of the present investigation indicate that the herbal peel-off mask containing *Clitoria ternatea* peel extract possesses good antioxidant potential. pH, viscosity, spreadability, drying time and homogeneity of F8 formulations was evaluated.

Based on the findings of the present study, the formulated herbal peel-off mask demonstrated effective activity against various skin infections caused by *Staphylococcus aureus*. As the formulation was developed using natural ingredients with a minimal amount of chemical excipients, it is considered safe for topical application.

Furthermore, the formulation of the herbal peel-off mask exhibited notable antioxidant activity. Among them, formulation F8 was identified as the optimized formulation due to its superior performance. The major advantage of the optimized peel-off mask is its ability to rejuvenate and hydrate the skin, thereby improving overall skin texture.

**REFERENCE**

1. Bijauliya K, Rohit, Alok S, Kumar M, Dilip CK, Yadav S. A comprehensive review of herbal cosmetics. *Int J Pharm Sci Res.* 2017;8(12):4930-31.
2. Pal M, Pushpendra, Saxena R, Kanyal R, Singh D, Diksha D, et al. A detailed analysis of herbal cosmetics. *NeuroQuantology.* 2022;20(15):63-7.
3. Ross, Wilson. *Textbook of Anatomy and Physiology in Health and Illness.* 2014. p.362-73.
4. Kasolang S, Adlina AW, Rahman A, Norhanifah, Rosley N, Roselina N. Common skin disorders: A review. *J Tribologi.* 2020;25:75-7.
5. Mahajan SB, Patil H, Solanki K, Tare T, Wagh S, Sonare P, et al. Formulation and evaluation of herbal peel-off mask. *Int J Sci Res.* 2024;84(4):143-9.
6. Ajay BR, Shyam A, Kavitha PN. A study on preparation and evaluation of herbal peel-off mask. *Int J Multidiscip Res.* 2023;5(5):4-5.
7. Buvango SP, Nalawade P, Dhotre B, Rathod AR, Dhanusree A, Vikas R. A research on formulation and evaluation of butterfly pea herbal peel-off mask. *Int J Sci Innov Eng.* 2025;2(6):342-3.
8. Sahira AJ, Deuri S, Astuti S. A study of antibacterial activity of *Staphylococcus aureus* and *E. coli*, combination of butterfly pea flower extract (*Clitoria ternatea* L) and honey. *Int Conf Med Sci Health.* 2023:80-4.
9. Wulansari E, Siswanto A, Diniatik. Formulation and optimization of peel-off gel mask base of red rice ethanolic extract in combination of HPMC and PVA using factorial design method. *J Kefarm Indo.* 2025;15(1):34-45.
10. Burange PS, Nalawade PP. Research on formulation and evaluation of butterfly pea herbal peel-off mask: A natural approach to skincare. *Int J Sci.* 2025:339-47