Chapter 4  
Result and Discussion

This chapter mainly stress on compilation of results of present investigation and their interpretation, it consists of five parts. First part deals with the extraction process of the herbs (Neem, Aloe Vera, Papaya leaves) with **Maceration method**. Second part consists of **antibacterial test** of the fabric. Third part deals with the wash fastness of the fabric. Fourth part deals the perspiration test what is the effect of perspiration (acidic and alkaline) on the medicated fabric. Fifth part consists of clinical trial.

4.1. Analysis of extraction process of three herbs Neem, Aloe Vera, Papaya leaves.

4.2. Analysis of the medicated fabric at 12%, 25%, 50%.


4.1. Analysis of extraction process of three herbs Neem, Aloe Vera, Papaya leaves: -

- The extraction process was done with the help of maceration method. 500gms of grind powder of herbs requires about 2500 ml of liquor for extraction process i.e 1250ml: 1250ml ethanol and distilled water. The table no.6 shows that Herbal extracts are dark brown in color, Neem extract having henna like odor and in Aloe Vera and Papaya burning like odor, texture was very sticky and thick, and the viscosity of the extract was very high it was semi-solid.
- The waste or residue which is left after the process can be used for the manure purpose in the fields. As herbs are not harmful for the agriculture. It was also observed that Papaya leaves waste or residue when kept in humid condition, was
attacked by fungus on the other hand there were no fungus on the Neem and Aloe Vera residue as shown in figure no.21.

<table>
<thead>
<tr>
<th>S.no</th>
<th>Herbal extract</th>
<th>Colour of the extract</th>
<th>Texture of the extract</th>
<th>Odor of the extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Neem leaves</td>
<td>Dark brown</td>
<td>Sticky and thick</td>
<td>Henna (mehandi)</td>
</tr>
<tr>
<td>2</td>
<td>Aloe Vera</td>
<td>Dark brown</td>
<td>Sticky and thick</td>
<td>Burning</td>
</tr>
<tr>
<td>3</td>
<td>Papaya leaves</td>
<td>Dark brown</td>
<td>Sticky and thick</td>
<td>Burning</td>
</tr>
</tbody>
</table>

Table no. 6|Analyses of extraction process of the herbs.
4.2. Analysis of the medicated fabric at 12\%, 25\% and 50\%:—Antibacterial test was conducted to check the effect of herbs on Propionibacterium acnes. Agar plates was prepared and herbal extract coated sample 3cm×1 cm was placed and after 24 hours it has been observed that at 12\% concentration Neem extract coated fabric work against Propionibacterium acnes; the zone of inhibition was 420 mm$^2$ approximately. On the other hand Aloe Vera and Papaya leave extract fabric does not work against Propionibacterium acnes at 12\% concentration. This shows that Neem is very much effect against Propionibacterium acnes. Aloe Vera and Papaya do not have potential to work against P.acnes. As shown in table no.7 and figure no.22.

<table>
<thead>
<tr>
<th>S.no</th>
<th>Herb (12%)</th>
<th>Zone of inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Neem</td>
<td>420mm$^2$ approximately</td>
</tr>
<tr>
<td>2</td>
<td>Aloe Vera</td>
<td>Nil</td>
</tr>
<tr>
<td>3</td>
<td>Papaya leaves</td>
<td>Nil</td>
</tr>
</tbody>
</table>

Table no.7. 12\% Herbal coated fabrics zone of inhibition.
Figure no.21. Zone of inhibition (i) Neem (ii) Aloe Vera (iii) Papaya (12%)

It has been observed that at 25% concentration Aloe Vera and Neem coated fabric was having 176mm\(^2\) .500mm\(^2\)zone of inhibition it means Aloe Vera and Neem coated fabric work against bacteria and Papaya leaves coated fabric do not show zone of inhibition which means that papaya leave extract at 25% does not work against the bacteria. As shown in table no.8 and figure no.23.

<table>
<thead>
<tr>
<th>S.no</th>
<th>Herb (25%)</th>
<th>Zone of inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Neem</td>
<td>500mm(^2) approximately</td>
</tr>
<tr>
<td>2</td>
<td>Aloe Vera</td>
<td>176mm(^2) approximately</td>
</tr>
<tr>
<td>3</td>
<td>Papaya leaves</td>
<td>Nil</td>
</tr>
</tbody>
</table>

Table no.8.25% Herbal coated fabrics zone of inhibition.

Figure no.22. Zone of inhibition (i) Neem (ii) Aloe Vera (iii) Papaya (25%)
With the experiment observations show that at 50% concentration Neem has 785.7 mm$^2$; Aloe Vera is having 312 mm$^2$ and Papaya leaves is having 540 mm$^2$ zone of inhibition. The highest zone of inhibition was Neem leaves extract at 50% concentration and the lowest was Aloe Vera. As shown in table no.9 and figure no.24.

<table>
<thead>
<tr>
<th>S.no</th>
<th>Herb (50%)</th>
<th>Zone of inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Neem</td>
<td>785.7 mm$^2$ approximately</td>
</tr>
<tr>
<td>2</td>
<td>Aloe Vera</td>
<td>312 mm$^2$ approximately</td>
</tr>
<tr>
<td>3</td>
<td>Papaya leaves</td>
<td>540 mm$^2$ approximately</td>
</tr>
</tbody>
</table>

Table no.9. 50% Herbal coated fabrics zone of inhibition.

Figure no.23. Zone of inhibition (i) Neem (ii) Aloe Vera (iii) Papaya (50%)
Analysis of Data

Pie chart 1. Zone of inhibition of coated fabric at different concentration (12%, 25%, and 50%)

- The above graph shows that Neem leave extract work against Propionibacterium acnes at all the three concentrations (12%, 25% and 50%).
- Aloe Vera extract work against Propionibacterium acnes at 25% and 50%.
- Papaya leaves extract work against Propionibacterium acnes at 50% only. It shows that Neem is very much beneficial for the treatment of back acne as compared to Aloe Vera and Papaya.

4.3. Analysis of medicated fabric under Scanning Electron Microscopy (SEM):

The presence of Neem coating on fabric is being analyzed by Scanning Electron Microscopy (SEM). The SEM photograph is shown in figure no.25, 26,27,28,29,30,31,32 at different magnification level it is clear that the Neem coating are present on the walls of the fiber and yarn.
Figure no.24, 25, 26 and 27. SEM of treated fabric (coating of Neem)
Figure no.28, 29. SEM of treated fabric (coating of Neem)

Figure no.30, 31. SEM of Untreated fabric
4.4. Analyses of the wash fastness of Neem medicated fabric:- the Neem medicated fabric does not have wash fastness it is not durable up to 2-3 washes. When the fabric was washes and again antibacterial test was conducted there was no inhibition zone as shown in figure no.33. Periodically fabric was treated with the herbal finishes. The main drawback of the study was the finish was not durable. It is able to cure the disease. Out off three herbs we have taken Neem as for the clinical trial because while conducted the antibacterial test Neem has shown the best result against Propionibacterium acnes.

![Figure no.32. After wash Neem medicated fabric](image)

4.5. Analyses of perspiration of medicated fabric:- in perspiration test multi-fiber fabric has been taken, both acid and alkaline test was conducted the change in colour was observed was the grading scale no.1 change in colour (grey scale for evaluating change in colour including half-step) ISO 105-A03:1993, BSEN 20105-A03:1995 as per ISO, BS and European standard the observation shows that in acid it is 2 and in alkaline its 2 means in both alkaline and acid the colour fastness of the fabric was poor. The staining was observation shows that in acid it is 2 and in alkaline it is 2 means in acid and alkaline the staining was poor.

By observation bases rating was done on five point scale:-


**Patient profile:-1**

Name:- Smita Chaudhary

Age:- 27 year

Sex:- Female

Profession:- Teaching.

Symptoms:- Itching, Pain, Red spots.

<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
</tr>
</thead>
</table>

The subject feels that the camisoles are effective because by wearing the camisoles itching and red spots has decreased.

Rating:- 3. Good
**Patient profile:-2**

Name:- Jyotshana Singh  
Age:- 18 year  
Sex:- Female  
Profession:- Student  
Symptoms:- Itching, Pain, White spot.

Before  

The observation shows that before wearing the camisoles there are white spots and the size of back acne was also big. By wearing the camisoles regular it reduces the size, itching was not there and white spots become dry form.

Patient profile:-3

Name:- Varnika Sharma

Age:- 18 year

Sex:- Female

Profession:- Student

Symptoms:- Itching, Red spots.

Before                                                                       After

The observation shows that there was reduction in size and pain relief. The subject feel that these camisoles are very much effective for the patients those who are suffering from back acne.

Rating:-3, Good.
Patient profile:-4

Name:-Anchal
Age:-21 year
Sex:-Female
Profession:-Student.
Symptoms:-Itching, Pain.

Before                                                             After

The observation shows that back acne was reduced and the black marks were left, itching was not there and there was no pain.
Rating:-3.Good
Patient profile 5

Name:-Aarshiya

Age:-25 years

Sex:-female

Profession:-Housewife.

Symptoms: - Red spots, Itching.

Causes:-Constipation, side effect of medicines.

The patient was suffering from epilepsy from the age of 8 years, by the doctor 3 years course was recommended to the patient but due to unawareness she does not stop the treatment after 3 year also and continuous in take of the medicines which results into the of causes back,front, face acne to patient.

![Before- Back](before_back.jpg) ![Front](front.jpg) ![After](after.jpg)

The observation shows that there are very slight improvements in condition of back acne of the subject.

Rating:-5. Poor