6.0 FORMULATION STUDIES

6.1 FORMULATION

All the powdered material of five plants were mixed in various proportions and filled in Capsules without any additives.

The various proportion used in the formulation were shown in the Table No.24

**TABLE - 24**

**FORMULATION DATA**

<table>
<thead>
<tr>
<th>Formulations</th>
<th>Dalbergia sissoo</th>
<th>Cassia fistula</th>
<th>Cissus quadrangularis</th>
<th>Clitorea ternatea</th>
<th>Amorphophyllus campanulatus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formulation I</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Formulation II</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Formulation III</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Formulation IV</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Formulation V</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Formulation VI</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
6.2 STANDARDIZATION

In a polyherbal formulation it will be very difficult if we want to estimate each and every ingredient in terms of their chemical constituents. But if few major constituents having the particular therapeutic action as indicated in the label can be pinpointed, then those constituents should be estimated quantitatively along with other parameters in presence of all ingredients can be confirmed and pattern of their chemical constituents.

Polyherbal formulations were standardized by following tests.
FLOW CHART FOR POLYHERBAL STANDARDIZATION

Standardization

Qualitative

Organoleptic

Appearance

Color

Taste

Smell

Phenolic,

Organic

Compounds

Glycoside

Steroid

Flavonoid

Quantitative

Routine

Organic

Inorganic

Na,K,Ca,Mg,etc,

Tannin,

Resin,

Alkaloid

Analysis

General

Estimations

Other

Estimations

Gravimetric

Total ash

Water soluble ash

Acid insoluble ash

Metal estimations

Reducing /

non reducing sugars

Loss on drying

Volumetric

Water soluble ash

Alcohol soluble matter

Acid soluble matter

Titrimetric

Saponification value

Acid value

Ester value

Iodine value

Powder Characteristics

Angle of repose

Bulk density
1] **Determination of Saponification Value**

An appropriate amount of oil (obtained form petroleum extract of the drug) was weighed in a 200 ml of borosilicate glass, added 25 ml of 0.5 N ethanolic potassium hydroxide added along with few glass beads and refluxed on water bath for 30 minutes. Dil. phenolphthalein solution (1ml) was added and titrated with 0.5 M Hydrochloric acid. The number of ml required (a) was recorded and blank value also found (b). The saponification value was calculated form the values of a and b.

2] **Determination of acid value**

The substance (1gm) was taken in 250 ml flask and added 50 ml of a mixture along with equal volume of alcohol and solvent ether which had been neutralized after the addition of 1 ml of phenolphthalein solution and titrated with 0.1N KOH shaking constantly until the pink color persists for 15 minutes.

3] **Determination of bulk density**

A sample of about 50 cm$^3$ of powder, which has previously been passed through a U.S. Standard No.20 sieve is carefully introduced into a 100-ml graduated cylinder. The cylinder is dropped at 2 second intervals onto a hard wood surface three times from a height of 1 inch. The bulk density is than obtained by dividing the weight of the sample in grams by the final volume in cm$^3$ of the sample contained in the cylinder.

4] **Determination of angle of repose**

A funnel is fixed at a particular height ‘h’ cm on a burette stand. A white paper is placed below the funnel on the table. The given powdered drug whose angle of repose is to be determined is passed slowly through the funnel, until it forms a pile.
Care is taken to see that the drug particles slip and roll over each other through the sides of the funnel. Further addition of drug is stopped as soon as the drug pile touches the tip of the funnel. Circumference of the pile of drug is drawn with a pencil without disturbing the pile. The height of the pile \( h \) and the radius of the base \( r \) is measured with the ruler. The angle of repose is thus estimated.
### TABLE -25

**PHYSICOCHEMICAL EVALUATION OF FORMULATIONS**

<table>
<thead>
<tr>
<th>Physiochemical Constants</th>
<th>Formulation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td><strong>A) Extractive Values</strong></td>
<td></td>
</tr>
<tr>
<td>Alcohol Soluble Extractive Values</td>
<td>17.00%</td>
</tr>
<tr>
<td>Water Soluble Extractive Values</td>
<td>12.19%</td>
</tr>
<tr>
<td><strong>B) Ash Value</strong></td>
<td></td>
</tr>
<tr>
<td>Total Ash</td>
<td>10.30%</td>
</tr>
<tr>
<td>Acid Insoluble</td>
<td>01.35%</td>
</tr>
<tr>
<td>Water Soluble</td>
<td>02.00%</td>
</tr>
<tr>
<td>Loss on drying</td>
<td>9</td>
</tr>
<tr>
<td>Angle of Repose</td>
<td>25.02°</td>
</tr>
<tr>
<td>Bulk Density (g/cm³)</td>
<td>$0.5 \times 10^3$</td>
</tr>
</tbody>
</table>