4. METHODOLOGY

5.1 GATHERING AND AUTHENTIFICATION OF PLANT SUBSTANCES

In the present study the matured seed part of *Trigonella foenum graecum*, roots of *Glycyrrhiza glabra* and fruits of *Cordia myxa* were taken from the confined bazaar of Bardoli, Gujarat. They were authenticated by botanist, Dr. B. N. Patel, Dept. of Botany, Patidar Gin Science College, Bardoli.

Soon after authentication, all materials were dried at room temperature, until they were free from the moisture and subjected to physical evaluation with different parameters. The parameters, which were used for evaluation, are colour, odour, taste, size and shape.

Lastly they were directed to bulk diminution to obtain crude crush and then conceded from sieve no. 40 to acquire consistent crush.

Then the homogeneous crush was directed to standardization with different parameters as per Pharmacopoeias.

5.2 ASSESSMENT OF EXCELLENCE CONTROLLING PARAMETERS

1) PHARMACOGNOSTICAL STUDY

- **Macroscopic Examination**
  
  Themorphology or macroscopical explanation of an unfinished remedy comprises shape, size, fracture type, surface observation and organoleptic properties like taste, colour and odour are examined. The results are exposed in table 6.1, 6.2 and 6.3.

- **Microscopic Examination**
  - **Transverse section of plant material**

  The seeds of *Trigonella foenum graecum*, roots of *Glycyrrhiza glabra* and fruits of *Cordia myxa* were subjected to microscopical evaluation. Free hand sections were in use and blemished with quantity of chemicals for histochemical assessment. All the observation of the microscopical study were made and recorded with the help of special camera attached with microscope. The results are shown in figure 6.4, 6.6 and 6.8.
• **Powder characterization by microscopy**
  Boil the crude crush for 5 minutes using chloral hydrate solution, and then stained with phloroglucinol and HCl (1:1). Subject it to microscopical observation (Khandelwal, 1995). Results are shown in figure 6.5, 6.7 and 6.9.

2) **Physiochemical Parameters of Plant Material**

  ❖ **Moisture content**
  Precisely weighed 10 gm of crude grind drug and sited in a tarred evaporating plate. Drying was conceded out for 5 hours at 105 °C. Sample was weighed. This process of weighing and drying was agreed out at an interval of one hour waiting the constant weight obtained. On the origin of quantity of sample drug taken, percentage moisture content was intended (Quality Control Methods for Medicinal Plant Materials, 2002). Results are shown in table 6.4, 6.5 and 6.6.

  ❖ **Evaluation of Ash**
  • **Total**
    Exact quantity about 2 to 4 gm of crush was incinerated in silica crucible at temperature not greater than 450 °C. To attain carbon free ash in further way, burnt mass bushed through hot water. Take residues on ashless paper. Subject it to incineration at temperature not greater than 450 °C. (Quality Control Methods for Medicinal Plant Materials, 2002).

  • **Acid insoluble**
    Crucible with total ash was in use, to which 25 ml of HCl was introduced. Take residues on ash less paper (whatman 41). Filtrate was rinsed though hot water. Crucible with paper having insoluble material was ignited at temperature not more than 450 °C for 15 minutes. Residue subjected to cooling upto 30 minutes in desiccator and measured. Quantity of ash designed with orientation to air desiccated remedy.

  • **Watersoluble**
Crucible with total ash was taken, in which 25 ml water introduced in addition boiled upto 5 min. Insoluble subject was taken on ashless filter paper or Sintered glass crucible, washed by means of hot water. Convey the inseperable material containing paper to crucible. Subjected to ignite upto 15 minutes at temperature not greater than 450° C. Residue cooled in desiccators and measured. Quantity of ash designed with orientation to air desiccated remedy.

Results are publicized in table 6.4, 6.5 and 6.6.

- Examination of extractive material
- Alcohol soluble
  Precisely measured 5 gm of pulverized dried matter was introduced inconical flask. Matter was macerated for 24 hours by taking 100 ml of alcohol. It was traumatized recurrently for the initial 6 hrs and permitted it to hang up to 18 hours. Solution was filtered. From solution 25 ml of filtrate was taken into tarred evaporating dish in addition subjected to evaporation to aridness on water bath. The percentage was considered with orientation to air dehydrated drug (Quality Control Methods for Medicinal Plant Materials, 2002).

- Water soluble
  Precisely measured 5 gm of pulverized dried matter was introduced inconical flask. Matter was macerated for 24 hours by taking 100 ml of water. It was traumatized recurrently for the initial 6 hrs and permitted it to hang up to 18 hours. Solution was filtered. From solution 25 ml of filtrate was taken into tarred evaporating dish in addition subjected to evaporation to aridness on water bath. The percentage was considered with orientation to air dehydrated drug.

Results are revealed in table 6.4, 6.5 and 6.6.

Preliminary Phytochemical Investigation
Qualitative compound tests to recognize diverse phytoconstituents in attendance were conceded on assorted extracts of seeds of *Trigonella foenum graecum*, roots of *Glycyrhiza glabra* and fruits of *Cordia myxa* (Khandelwal, 1995
and Kokate CK, 2002).

❖ **Alkaloids**
Dissolved the extracts discretely in dilute HCl and filtered. A choice of test approved out cautiously by treating it with diversereagents.

- **Mayer’s Test:** Treat filtrates with Mayer’s reagent. Configuration of yellow cream impulsive indicated attendance of alkaloids.

- **Wagner’s Test:** Treat solution with Wagner’s reagent. Development of reddish brown impetuous indicated incidence of alkaloids.

- **Dragendorff’s Test:** Treat filtrates with with Dragendorff’s reagent. Construction of red ppt indicated occurrence of alkaloids.

- **Hager’s Test:** Introduce filtrate with Hager’s reagent. Creation of yellow colored impulsive indicated attendance of alkaloids.

❖ **Proteins**

- **Millons Test:** Introduced extracts with2 ml Millons reagent. Arrangement of white ppt turning red on heating, specifies testpositive.

- **Biuret Test:** Treat extracts with 1ml 10% NaOH solution. Heat it. Add drop of 0.7% CuSO₄. Creation of purplish violet tint designated test positive.

- **Ninhydrin Test:** Introduce 0.25% ninhydrin reagent to extracts. Boiled it for sometime. Development of blue blush specified test positive.

❖ **Carbohydrates:** Incorporateextracts discretely in 5ml distilled water. Filter it and determine results.

- **Benedict’s test:** Treatfiltrates with Benedict’s reagent. Heat solution.Construction of orange- red impulsive proved incidence of sugars.
- **Molisch’s Test**: Filtrates treated with 2 drops of alcoholic α-naphthol solution, to which, cautiously added 2 ml concentrated sulphuric acid. Arrangement of violet ring at the intersection proved the positive results.

- **Fehling’s Test**: Add dil. HCl to induce hydrolyzation of filtrate. Neutralized by adding alkali. Take equal amount of Fehling’s A and B solutions. Solution was animated. Red tint was shaped which confirms occurrence of sugars.

- **Barfoed’s Test**: Add Barfoed’s reagent into solution. Heat it. Pattern of red tint designated existence of sugars.

- **Flavonoids**
  - **Shinoda test**: Obtain the amount of extract, in which introduced a piece of magnesium ribbon and 1 ml of concentrated hydrochloric acid. Pink or red bloom of the solution stipulated the existence of flavonoids.

- **Phenols**
  - Get the filter paper and a drop of extract was marked on it. Introduced a drop of phosphomolybdic acid on it. Then expose the spot to ammonia vapor. Blue tint of the spot stipulated the test affirmative.

- **Glycosides**
  - Determination of glycosides was conceded out by hydrolyzing the extract with dilute hydrochloric acid and performing the variety of glycosides tests.
  - **Borntrager’s Test**: Get the extracts and to which added ferric chloride solution. Boil it. Cooled solution was traumatized with equivalent quantity of C₆H₆. Half quantity of ammonia solution was added to Benzene layer. The achievement of rose pink or red bloom of specified existence of glycoside.
  - **Legal’s Test**: Introduce extracts with methanolic alkali. Add sodium nitroprusside. Configuration of pink-red shade designated attendance of glycosides.
**Balget Test:** Take the sodium picrate solution and incorporated into extract of drug. The pattern of a yellowish orange tint established the incidence of cardiac glycosides.

**Killer killani Test:** Dried extract was incorporated in 2 ml glacial acetic acid. Add a slump of FeCl$_3$ solution. 1 ml of concentrated sulphuric acid was added. A brown ring gained at incidence confirmed cardenolides.

❖ **Saponins**

❖ **Froth’s Test:** Dilute the extracts independently with distilled water. Shake combination in graduated cylinder up to 15 minutes. A layer of foam was fashioned which stipulated the occurrence of saponins.

❖ **Tannins**

❖ **Ferric chloride Test:** Extracts were subjected to neutral FeCl$_3$ solution. Development of bluish black flush designated existence of phenolic nucleus.

❖ **Lead acetate Test:** Treat extracts with lead acetate solution. Creation of white impulsive inveterated existence of tannins.

❖ **Phytosterols**

❖ **Liebermann-Burchard test:** To one ml of extract, one ml of CHCl$_3$ and 2 to 3 ml of (CH$_3$CO)$_2$O was added. To the above mixture, drops of concentrated Sulphuric acid were introduced. Dark green tint of the solution confirmed the attendance of steroids and dark pink or red bloom of the solution stipulated the existence of triterpenoids.

❖ **Salkowski’s test:** Obtain the extracts and treat in CHCl$_3$ and concentrated H$_2$SO$_4$, agitate well and let the same position for few minutes, red blush presents in lower layer designates attendance of sterols. Arrangement of yellow tinted lower layer represent incidence of triterpenoids.
✦ Gums

- Test solution was hydrolysed using dilute HCl and Fehling’s test was performed. Red colour developed.

✦ Mucilage

- Powdered drug material showed red color with ruthenium red.
- Powdered drug swollen in water or aqueous KOH.

Results of phytochemical tests are specified in table 6.7, 6.8 and 6.9.

3) EXTRACTION AND PURIFICATION OF MUCILAGE

✦ Extraction of mucilage of *Trigonella foenum-graecum* by conventional method

Seed part of *Trigonella foenum-graecum* (5 gram) was pulverized in an involuntary mixer for 5 minutes. Keep in D.W. (150 ml) in round bottom flask for 24 hours. Boiled it for 1 hour beneath reflux with infrequent moving and set apart for 2 hour to liberate the mucilage into water. Filtered the matter and incorporate hot D.W. (25 ml) from sides of marc. Equivalent quantity of ethanol added to precipitate mucilage. Keep inside refrigerator to settle down its mucilage. Filtered and dehydrated mucilage in an incubator at 37 °C, minced and weighed(Shah B, 2010). Results are revealed in table 6.10.

✦ Extraction of mucilage of *Trigonella foenum graecum* by microwave assisted method

The seedpart of *Trigonella foenum graecum* was pulverized for 5 minutes in an involuntary mixer and drenched for 24 hours in distilled water (150 ml). It was held in reserve in microwave alongside glass tube within to avoid bumping. Beaker was taken from oven.Set aside for two hour to liberate mucilage. Filtrate having mucilage is taken for additional seclusion. Method operated in parallel approach as explained in conformist practice, weighed. Chemical recognition was conceded out. Testing was continued upto numerous periods using a variety of intensities and diverse durations. In every case, the yield was considered(Shah B, 2010 and Geetha B, 2009). Results are exposed in table 6.10.
Extraction of mucilage of *Glycyrrhiza glabra* by conventional method

The roots of *Glycyrrhiza glabra* (5 gram) was pulverized in an involuntary mixer for 5 minutes. Dissolve in D.W. (150 ml) in round bottom flask for 24 hours. Boiled it for 1 hour beneath reflux with infrequent moving and set apart for 2 hour to liberate the mucilage into water. Filtered the matter and incorporate hot D.W. (25 ml) from sides of marc. Equivalent quantity of ethanol added to precipitate mucilage. Keep inside refrigerator to settle down it mucilage. Filtered and dehydrated mucilage in an incubator at 37 °C, minced and weighed (Shah B, 2010). Results are publicized in table 6.11.

Extraction of mucilage *Glycyrrhiza glabra* by microwave assisted method

The seeds of *Glycyrrhiza glabra* was pulverized for 5 minutes in an involuntary mixer and drenched for 24 hours in distilled water (150 ml). It was held in reserve in microwave alongside glass tube within to avoid bumping. Beaker was taken from oven. Set aside for two hour to liberate mucilage. Filtrate having mucilage is taken for additional seclusion. Method operated in parallel approach as explained in conformist practice, weighed. Chemical recognition was conceded out. Testing was continued up to numerous periods using a variety of intensities and diverse durations. In very case, the yield was considered (Shah B, 2010). Results are exposed in table 6.11.
Extraction of mucilage of *Cordia myxa* by conventional method

The fruits part of *Cordia myxa* (5 gram) was pulverized in an involuntary mixer for 5 minutes. Dissolve in D.W. (150 ml) in round bottom flask for 24 hours. Boiled it for 1 hour beneath reflux with infrequent moving and set apart for 2 hour to liberate the mucilage into water. Filtered the matter and incorporate hot D.W. (25 ml) from sides of marc. Equivalent quantity of ethanol added to precipitate mucilage. Keep inside refrigerator to settle down it mucilage. Filtered and dehydrated mucilage in an incubator at 37 °C, minced and weighed (Shah B, 2010). Results are given away in table 6.12.

Extraction of mucilage *Cordia myxa* by microwave assisted method

The seeds of *Cordia myxa* was pulverized for 5 minutes in an involuntary mixer and drenched for 24 hours in distilled water (150 ml). It was held in reserve in microwave alongside glass tube within to avoid bumping. Beaker was taken from oven. Set aside for two hour to liberate mucilage. Filtrate having mucilage is taken for additional seclusion. Method operated in parallel approach as explained in conformist practice, weighed. Chemical recognition was conceded out. Testing was continued up to numerous periods using a variety of intensities and diverse durations. In every case, the yield was considered (Shah B, 2010 and Geetha B, 2009). Results are exposed in table 6.12.

4) **OPTIMIZATION OF MICROWAVE PROCESS**

Extraction Process Optimization for *T. foenum graecum* seeds

From groundwork outcome, $2^3$ full factorial plan employed here. In such plan, determination of three factors was agreed out, each at two levels. Experimental trials are conceded out at all eight likely combinations.

Factorial lessons were conceded out by means of three diverse variables viz. intensity, solvent volume and time. The consequence on % yield of mucilage was considered. In factorial mean, the intensity ($X_1$), solvent volume ($X_2$) and time ($X_3$) were in use as independent variables for factorial design.

The investigational propose was $2^3$ full-factorial designs, and 8 batches were equipped. In factorial plan the 3 independent variables were the intensity ($X_1$),
solvent volume (X2) and time (X3) with low (-1) and high (+1) values. Low (-1) and high (+1) values of X1 were 320 and 480 W, 150 and 175 ml, 30 and 35 min. Eight batches were organized (Batch F1 to F9). The organizations of the 8 batches are revealed in Table 6.16.

**Extraction Process Optimization for G. glabra roots**

From groundwork outcome, $2^3$ full factorial plan employed here. In such plan, determination of three factors was agreed out, each at two levels and experimental trials are conceded out at all eight likely combinations.

Factorial lessons were conceded out by means of three diverse variables viz. intensity, solvent volume and time. The consequence on % yield of mucilage was considered. In factorial mean, the intensity (X1), solvent volume (X2) and time (X3) were in use as independent variables for factorial design.

The investigational propose was $2^3$ full-factorial designs, and 8 batches were equipped. In factorial plan the 3 independent variables were the intensity (X1), solvent volume (X2) and time (X3) with low (-1) and high (+1) values. Low (-1) and high (+1) values of X1 were 320 and 480 W, 150 and 175 ml, 30 and 35 min. Eight batches were organized (Batch F1 to F9). The organizations of the 8 batches are revealed in Table 6.24.

**Extraction Process Optimization for C. myxa fruits**

From groundwork outcome, $2^3$ full factorial plan employed here. In such plan, determination of three factors was agreed out, each at two levels and experimental trials are conceded out at all eight likely combinations.

Factorial lessons were conceded out by means of three diverse variables viz. intensity, solvent volume and time. The consequence on % yield of mucilage was considered. In factorial mean, the intensity (X1), solvent volume (X2) and time (X3) were in use as independent variables for factorial design.

The investigational propose was $2^3$ full-factorial designs, and 8 batches were equipped. In factorial plan the 3 independent variables were the intensity (X1), solvent volume (X2) and time (X3) with low (-1) and high (+1) values. Low (-1) and high (+1) values of X1 were 320 and 480 W, 150 and 175 ml, 30 and 35 min. Eight batches were organized (Batch F1 to F9). The organizations of the 8 batches are exposed in Table 6.32.
5) **PHYSIOCHEMICAL CHARACTERISTICS OF MUCILAGE**

- **Examination of pH**
  
  pH value was examined using digital pH meter. Operation of pH meter carried out as per the manufacturer’s directions. Foremost the calibration of apparatus was done by means of buffer of 4, 9 and 7 pH. Dissolve 1 gm of Mucilage in 100 ml demineralized water. Immersed electrodes in solution. Determine pH (Quality Control Methods for Medicinal Plant Materials, 2002).

- **Evaluation of ash**
  - **Total**

  Exactly quantity about 2 to 4 gm of crush was incinerated in silica crucible at temperature not greater than 450 °C. To attain carbon free ash in further way, burnt mass bushed through hot water. Take residues on on ashless paper. Incinerate at temperature not greater than 450 °C. (Quality Control Methods for Medicinal Plant Materials, 2002).

- **Examination of Viscosity**

  1 gram dehydrated and delicately minced mucilage (1 g) was perched for 5 hour in 75 ml D.W. to construct concentration of 1 %. Mixture homogenized using motorized agitator upto 2 hour. Viscosity examined by means of a Brookfield viscometer spindle at 25 °C and 20 rpm (Majid Saeedi, 2010).

- **Determination of swelling index**

  1gm of powder was taken. 25 ml of water was added. Mixture was traumatized scrupulously for 3 hour at every 15 min and permitted to situate for 24 hr at RT. Examination done in triplicates. Volume in ml engaged by plant matter counting mucilage was considered. Mean value of ml was in use, associated to 1g of plant matter, stipulating the swelling index of a plant matter (Quality Control Methods for Medicinal Plant Materials, 2002).
Microbiological properties

Microbial Load

Grounding of Inoculums

Swing the 1 gram powder of mucilage in 10 ml sterile water. Transfer this 1 ml of mixture into 99 ml of blank. Blank is sterile water, diluted inoculum.

Plate Count Method

Transfer 1 ml of Inoculum and same amount of diluted inoculum to petri dishware. Incorporate 20 ml agar medium into each plate at 40-45˚ C. For all way through distribution of inoculums, both dishes were tenderly rotated all over medium and solidified (Michael J, 1993). Results are specified in table 6.40.

6) DRUG-EXCIPIENT COMPATIBILITY STUDIES

Lessons performed to check any compatibility associated troubles connected with drug and additives taken for preparing tablets. To construct a stable, effectual, simple to direct and safe product, there must exist compatibility between drug and excipients. If additives are not old in addition not been taken in preparations having active matter, compatibility criterias are of chief consequence. FTIR and thermal investigation employed to examine and forecast any physicochemical connections among components.

FTIR Spectroscopy

Using potassium bromide (KBr) disks FTIR spectra of samples recorded using Shimadzu Corporation, Model-1601 PC. Samples prearranged in KBr disks at hydrostatic pressure of 6-8 tons. 500 to 4000 cm⁻¹ was the scanning range. Results are publicized in figure 6.41-6.47.

Differential Scanning Calorimetry (DSC)

Using Shimadzu DSC-60, DSC analysis was performed. Into aluminum crucible, equal amount of medicine and additives was measured. Scanning speed of heating was 10°C/min above temperature ranging 20-300 °C beneath nitrogen atmosphere. Sample was examined (Murli Mohan GV, 2001). Results are given away in figure 6.37-6.40.
7) PREPARATION OF BINDER SOLUTION

To prepare binder solution, dissolve mucilages of *Trigonella foenum graecum*, *Glycyrrhiza glabra* and *Cordia myxa* in water at 4, 6 and 8 % w/v concentration. As Standard binder, starch grind dispersed in 20 ml of boiled D.W. with stirring. Volume made up to 100 ml at 4, 6 and 8 % w/v concentration. It was permissible to cool and used (Sabale V, 2009).

8) FORMULATION OF GRANULES

Damp granule forming method was adopted to formulate granules. To formulate granules, PCM was taken as model drug and lactose as diluents. Magnesium stearate as well as talc as lubricants. The medicine and lactose were assorted thoroughly and an enough quantity of 4, 6 and 8 % w/w of mucilage of *Trigonella foenum graecum*, *Glycyrrhiza glabra* and *Cordia myxa* was supplemented gradually to the powder blend. Unified damp batch created. As a standard 4, 6 and 8 % w/w was employed. Batch volume was 600 mg. Damp mass passed from sieve. Dry in an oven not greater than 60 °C up to loss on drying not more than 3%. Granules again sieved from sieve number 20. Evaluate formulated granules for flow properties as well as particle size. Bulk as well as tapped densities examined. Compressibility index examine by Carr’s compressibility index (Priti Late, 2014). Results are revealed in table 6.42.

**Examination of bulk and tapped densities**

Amount of known extent of granules from each batch gained before and after tapping. Amount before tapping taken to conclude the bulk density. Amount after tapping engaged to examine tap density scientifically. Additionally, Hausner’s quotient and Carr’s compressibility index examined.

**Bulk Density**

Precisely weighed grind was added to measuring cylinder and quantity was noted down. Bulk density was considered using subsequent equation,

\[
\text{pb} = \frac{M}{V_b}
\]
Here, \( pb = \) Bulk density (gm/cm\(^3\))

\[ M = \text{Weight of powder (gm)} \]

\[ V_b = \text{Bulk volume (ml)} \]

**Tapped Density**

Correctly weighed crush was taken in to measuring cylinder and tapped till steady volume is achieved. Tapped density was premeditated by subsequent equation,

\[ pt = \frac{M}{V_t} \]

Where, \( pt = \) Tapped density (gm/cm\(^3\))

\[ M = \text{Weight of powder (gm)} \]

\[ V_t = \text{Tapped volume (ml)} \]

**Compressibility Index (CI)**

Compressibility index was designed by means of the subsequent equation,

\[ \% \text{ CI} = \frac{(pt - pb)}{pt} \times 100 \]

Where, CI = Compressibility Index

**Hausner’s ratio (HP)**

Hausner’s ratio of the granules was considered by means of the subsequent equation,

\[ HP = \frac{pt}{pb} \]

Where, HP = Hausner’s ratio

**Assessment of flow property**

Angle of repose calculated as \( \tan \theta \) from height and radius of cone. Cone is shaped by granules as they flowed out of orifice. Take inverse of \( \tan \theta \)(Nagwaluka NC, 2010). Angle of repose of grind determined by fixed height funnel technique. Precisely weighed grind was in use in funnel. Elevation of funnel was attuned in ways like tip of funnel just touched apex of granules. Grind was permitted to flow through
funnel freely on to surface. Diameter of grind cone deliberated. Angle of repose considered,

\[ \tan \theta = \frac{h}{r} \]

Where \( h = \) Height (cm)
\( r = \) Radius (cm) of the powder cone

9) **FORMULATION AND EXAMINATION OF TABLETS**

الف. **Formulation of tablets**


الف. **Examination of tablets**

Prepared tablets examined for size, shape, weight uniformity, hardness, thickness, friability and disintegration time.

- **Weight uniformity test**

Twenty tablets from batch chosen arbitrarily and weighed. Mean weights, deviations, coefficients of deviation for each bunch were considered (Indian Pharmacopoeia, 1996).

**Table 4.1: Weight Variation Limits**

<table>
<thead>
<tr>
<th>Average weight of the tablet</th>
<th>Percent Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent deviation</td>
<td>Percent Deviation</td>
</tr>
<tr>
<td>130 mg or less 10</td>
<td>10</td>
</tr>
<tr>
<td>&gt;130 mg and &lt;324 mg 7.5</td>
<td>7.5</td>
</tr>
<tr>
<td>324 mg or more 5</td>
<td>5</td>
</tr>
</tbody>
</table>
• **Thickness and diameter**

  Thickness and diameter of six tablets examined by vernier callipers and. Middle value considered.

• **Tablet hardness test**

  Six tablets preferred from each bunch to execute test. Pfizer tester employed to examine hardness. Tablet positioned between spindle and anvil of tester. Calibrated scale adjusted zero, diametric compression force applied on tablet. Position on calibrated scale at point tablet ruined measured in kg/cm² units. Mean hardness premeditated for batch (Gangwar S, 2010). Results are specified in table 6.44.

• **Friability test**

  To assess the degree of friability of the tablets as of all set, ten tablets arbitrarily chosen, dusted and weighed. Tablets sited in a Roche friabilator. Tablets directed to tumbling actions for 4 minutes at 25 rpm. Afterwards, tablets another time dusted and reweighed. Percentage loss was examined (Lachman L, 1991). Results are revealed in table 6.44.

  \[
  \text{% Friability} = \frac{\text{initial weight of tablets} - \text{final weight of tablets}}{\text{initial weight of tablets}} \times 100
  \]

• **Disintegration time**

  Study designed in D.W. at 37 °C using Disintegration USP assembly. To conduct it, six tablets are involved. Disintegration time of granule of tablet was absence of particle on net of apparatus (Ngwaluka NC, 2010 and Gohel M, 2004). Results are prearranged in table 6.44.

• **Dissolution test**

  % CDR determination of compressed tablet examined using USP 2nd dissolution assembly. As dissolution medium, Phosphate buffer (pH 5.8) is added. Temperature maintained at 37 ± 2 °C. Rotation speed was 50 rpm. Samples reserved at usual intervals up to 1 hour continued. Replacement of it with fresh medium continued. Sample analyzed by UV spectrophotometer at 249 nm and % CDR calculated (British pharmacopoeia, 2005). Results exposed in table 6.45.
The subsequentsurroundings were maintained for the dissolution progression.

**Instrument:** Dissolution test apparatus

**Apparatus:** USP apparatus type II (Paddle)

**Temperature:** 37 ± 2 °C

**RPM:** 50

**Sample:** Tablet equivalent to 600 mg of drug

**Dissolution medium:** Phosphate buffer pH 5.8

**Volume of medium:** 900 ml

**Sample volume:** 10 ml reserved and replaced with 10 ml fresh medium

10 ml of sample reservedfiltered through whatmann filter paper. The absorbance of samples as well as blank determined at 249 nm by UV spectrophotometer. Quantity of drug here in filtrate plannedcommencing calibration curve equation. % CDR calculated.