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Formulation And Evaluation of Tablet Containing Leaves Extract of Acalypha Indica (Indian Nettle) In Masticable Form (Chewable Form)

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Abstract:
Acalypha Indica can serve as a treatment for a number of illnesses and conditions that affect people. This herb offers nutritional qualities and a variety of medicinal uses. The plant is frequently used to cure a variety of illnesses, including those with acaricidal, antibacterial, and antifungal properties. Leaves used for the treatment of rheumatic and gouty Joints, skin diseases, also used for the treatment of Tuberculosis, nausea and nervous disorders. Chewable tablets are the tablets that are intended to disintegrate smoothly in the mouth at the modern rate either with or without actual chewing. The purpose of the tablet is to provide unit dosage form of medication that can be easily administered to infants and elderly who may have difficulty in swallowing. To prepare the chewable tablet of ethanolic extract of *Acalypha Indica* Leaves using different excipients and to evaluate that disintegrates in mouth and provide an effective treatment for constipation. To improve the oral bioavailability and onset of action is prepared in the form of mouth dissolving tablets by direct compression method. The content of the chewable tablets was found in the range between 98.00 -102.00%. Disintegration time of Acalypha indica L extract chewable tablets were found between2.00 to 3.00 minutes. Stability results revealed that there were no significant changes found in physical appearance, weight, thickness, hardness, friability, disintegration time, drug content a during the period of 3 months even after stored at 25±2°C/60%±5%RH and 40±2°C/75%±5%RH.

Key words: Constipation**,** Bioavailability, Antibacterial and Stability.

INTRODUCTION

There are many therapeutic benefits of medicinal plants. *Acalypha Indica* can serve as a treatment for a number of illnesses and conditions that affect people. *Acalypha indica* is an annual herbaceous plant in the Euphorbiaceae family. Leaves used for the treatment of rheumatic and gouty Joints, skin diseases, also used for the treatment of Tuberculosis, nausea and nervous disorders. To treat urticarial patches, ginger is pounded with juice of Acalypha Indica leave powder and is given in a dose of 15-20 ml. The decoction prepared from the Leaves and fruit is given in a dose of 30-40 ml to treat splenomegaly and hepatomegaly. Anti-oxidative, anti-inflammatory and anti-pyretic of Acalypha indica chloroform extract have been found.



Fig No.1 *Acalypha Indica*

Chewable tablets are the tablets that are intended to disintegrate smoothly in the mouth at the modern rate either with or without actual chewing. The purpose of the tablet is to provide unit dosage form of medication that can be easily administered to infants and elderly who may have difficulty in swallowing. bitter and foul-tasting drugs are not the good candidate for such type of tablet and that intact restrict the use of chewable tablet dosage form. Chewable tablet is taken by mouth or oral cavity. Chewable tablets were prepared by using various methods liken Non aqueous Granulation/Dry granulation, Aqueous Granulation/Wet granulation, Direct compression. It provides improved bio-availability through bypassing integration. Absorption of drug is faster. It decreases the side effects of drugs. Administration without water promotes improved patient compliance.

AIM AND OBJECTIVE

Aim

The aim of the present study is to Formulation and Evaluation of Tablet containing Leaves Extract of Acalypha Indica (Indian Nettle) in Masticable Form (Chewable Form) that disintegrates in mouth and provide an effective treatment for constipation.

Objective

- To formulate the herbal extract into a solid dosage form
- To prepare the chewable tablet of ethanolic extract of Acalypha Indica Leaves using different excipients and to evaluate that disintegrates in mouth and provide an effective treatment for constipation.
- To improve the oral bioavailability and onset of action is prepared in the form of mouth dissolving tablets by direct compression method.
- The chewable tablet is easily accessible for self-medication and safe. Hence it is well accepted by patients.

Plan of work

- ❖ Literature review
- ❖ Selection of plant and polymer
- ❖ **Extraction**
- ❖ **Pre formulation studies**
- ✓ Calibration curve using UV- Visible spectroscopy
- ✓ Compatibility studies using FT IR spectroscopy
- ❖ Formulation of chewable tablet by Direct compression method
- ❖ **Evaluation studies of chewable tablet**

MATERIALS AND METHODS

Materials used in the present research are as follows

S.NO	MATERIALS	SOURCE
1.	Acalypha indica (Leaves)	Collected from Natural source
2.	Natural sweetener	S.D Fine chemicals, Mumbai
3.	Mannitol powder	Kroda Excipents
4.	Spearmint Oil	Bright Labs (Hyderabad)
5.	Magnesium Stearate	Abitec Corporation (USA).
6.	Citric acid	Astrra Chemicals
7.	Microcrystalline cellulose	Abitec Corporation (USA).
8.	Pre-gelatinized starch	Panchamrut Chemicals
9.	Sucralose	S.D Fine chemicals, Mumbai

Table No.1 Material details

Equipment used in present research are as follows

S.NO	Application/parameter measurement	Instrument/ Equipment
1.	To measure pH of system	PH meter (Elico LI127, INDIA)
2.	To measure the weight of ingredients	Electronic/ digital weighing balance (Sartorius CP124S, India & Swisser Instrument, India)
3.	To measure how quickly and completely a drug releases its active ingredients	Electrolab Tab. Disso.tester USP–TDT–06P
4.	To measure the resistance of a material to deformation	Monsanto Hardness Tester Cadmach
5.	To transforms powdered or granulated materials into solid tablets of uniform size, shape, and weight	Tablet compression machine ACG Worldwide.
6.	To assess the mechanical strength of tablets	Electrolab Friabilator (USP) – EF-1W
7.	To measure the absorbance and concentration	UV/Visible Spectrophotometer (Shimadzu 1700, Japan)
8.	Generation of IR spectra	FTIR Spectrophotometer
9.	To determine how quickly tablets or capsules break down into smaller particles when exposed to a liquid medium	Disintegration
10.	Solubility of drug in liquid	Sonicator Optics technology
11.	To improve mixing of liquids or improve solubility of solid in liquid	Vortex mixer (Remi elektrotechnik limited)

Table No.2 Equipment details

Methods

Plant collection and authentication:

Acalypha indica plant Leaves was collected from Nallampalli Village, Dharmapuri District, Tamil Nadu and India. The Plant was Authenticated by the Botanist of the Government Arts and Science College Dharmapuri.

Preparation of dry powdered samples:

The Leaves of *Acalypha indica* were washed to remove dust and dried under shade for about 25 days at 30+2^{o}c temperate. To get a constant weight, the dried plant materials were grinded to coarse powder separately by mechanical device, stored and used in this work throughout the study period.

Preparation of plant extracts

In this process, 500gm of the Leaves of the *Acalypha indica* was coarsely powdered crude drug is placed in an individual closed vessel with the Ethanol and allowed to stand at room temperature for a period of at least nine days with frequent agitation until the soluble matter has dissolved. The mixture then is strained, the marc the damp solid material is pressed and the liquids are clarified by filtration or decantation after standing. The filtrate was concentrated on the water bath and also sunlight. Finally dried form of powder was obtained and the dried extract was collected and stored in a desiccator to avoid the moisture absorption.

Qualitative phytochemical analysis

Phytochemical evaluation is used to determine the nature of phytoconstituents present in the plant. Therefore, a complete investigation is required to characterize the phytoconstituents qualitatively. The chemical tests for various phytoconstituents in the extracts of Leaves of *Acalypha indica* were carried out like Test of the Carbohydrate, Tannins, Alkaloids, Flavonoids, Saponins, Glycosides, Phenols and Triterpenoids.

Pre formulation studies

`Preformulation studies are of great importance for development of high-quality dosage formulations in the short duration. In this, physical & chemical characteristics and derived properties of API are determined and evaluated effectively. This is the first learning phase before formulation development. By this study, we can minimize errors, reduce the costing, and reduce no. of trials. Preformulation studies like fundamental characterization studies (Organoleptic properties, melting point, and loss on drying, solubility, and pH) and spectroscopic studies (UV and IR) were performed on drug sample.

Organoleptic properties

Organoleptic properties such as appearance, color, taste, odor etc. were evaluated for plant extract.

Color and nature: Transferred small quantity of the sample on a white piece of paper, spread the powder and examined visually.

Taste and odour: Very less quantity of Plant extract was used to get taste with the help of tongue as well as smelled to get the odour.

Solubility: The plant extract was dried in desiccators over CaO. Its solubility in water, methanol, ethanol, chloroform, petroleum ether, dil. NaOH, and dil. HCl was determined as follows: 1 mg of the dried extract was dissolved in 1 mL of the solvent at room temperature. Its solubility in each solvent was assessed qualitatively by visual observation.

Melting Point determination: It is the key parameter to identify the drug purity. It also helps in understanding of its crystallinity. Open capillary tube method was used to obtain melting point. Here solid was placed in capillary tube by apparatus I. It's one end was sealed and then attached to thermometer. The assembly was kept in liquid paraffin and on heating increase in temperature was checked continuously. The point at which drug started melting was noted and point at which complete melting of drug happens also noted down.

pH: 5% w/v solutions of drug were prepared with the help of gentle heat and pH was determined of each.

Calibration curve using uv- visible spectroscopy: The standard stock solution of *Acalypha indica.L*. Leaves extract was prepared by accurately weighing and transferring 10 mg of the extract to 100 ml of volumetric flask.

1) Then 2ml of the solution was added to 10ml volumetric flask and final volume was made up with phosphate buffer (PH 6.2±0.2) to get final standard solution(20µg/ml) Acalypha indica Leaves extract.
2) Then 4ml of the solution was added to 10ml volumetric flask and final volume was made up with phosphate buffer (PH 6.2±0.2) to get final standard solution (40µg/ml Acalypha indica Leaves extract.
3) Then 6ml of the solution was added to 10ml volumetric flask and final volume was made up with phosphate buffer (PH 6.2±0.2) to get final standard solution(60µg/ml) Acalypha indica Leaves extract.
4) Then 8ml of the solution was added to 10ml volumetric flask and final volume was made up with phosphate buffer (PH 6.2±0.2) to get final standard solution(80µg/ml) Acalypha indica L. Leaves extract.

These solutions were scanned in the range of 540nm. The calibration curve was plotted between absorbance values against concentration.

Compatibility studies using FTIR spectroscopy: IR spectroscopy is a key analytical method for chemical identification. The drug polymer interaction can also be studied by FTIR spectroscopy. Fourier–transform infrared (FT–IR) spectrum of moisture free powdered samples of pure extract was recorded by FTIR spectrophotometer by KBr pellet method. Scan range set at 400–4000 $cm^{-1}$and the resolution set at 1 $cm^{-1}$and the spectrum analysis was done for identification of sample.

Formulation of chewable tablet by direct compression method: The chewable tablets containing 300 mg the plant extract of *Acalypha indica* were prepared with a total tablet weight of 650 mg. All the formulation were prepared by direct compression.

Procedure

Step: 1 Acalypha indica powder and all the other ingredients were individually passed through a sieve no.30.
Step: 2 All the ingredients were mixed thoroughly by triturating up to 15 min by using poly bag.
Step: 3 Magnesium Stearate is sifted through 40 # added with Step: 2 mixing for 5 minutes. The tablets were prepared by using direct compression method according to the formulation table. Then the blend was compressed using caplet punch 16.50 x 8.50 mm.

Weighing	**Done by using analytical balance**
Sieving	Raw materials are sifted through Sieve No. (Mesh) 44
Blending	Done by using pharma-grade polyethylene (LDPE)
Lubrication	Magnesium stearate is sifted Sieve No.85
Compression	Compression is done by using caplet punch size- 12 × 5 mm (Standard adult dose)
Optional Coating	NA

Table No 3. Process for Direct Compression

Composition of the different formulation:

Name of ingredients	**Quantity of ingredients in mg**			
	Formulation-1	**Formulation-2**	**Formulation-3**	**Formulation-4**
Powdered Acalypha indica (Active drug)	300	300	300	300
Microcrystalline Cellulose	25	25	25	25
Starch (Pregelatinized)	60	58	61	59
Sucralose	15	14.5	16	14.5
Mannitol	212	220	219	215
Citric acid	30	25	20	28
Spearmint Oil	1	1.5	1	1
Magnesium Stearate	7	6	8	7.5
Total tablet weight	**650**	**650**	**650**	**650**

Table No 4. Composition of the different formulation

Evaluation studies of chewable tablet
Pre-formulation parameters:

Angle of repose: A funnel was filled to the brim and the test sample was allowed to flow smoothly through the orifice under gravity. From the cone formed on a graph sheet was taken to measure the area of pile, thereby evaluating the flow ability of the granules. Height of the pile was also measured.

$$\Theta = \tan^{-1}(h/r)$$

ANGLE OF REPOSE (Θ)	TYPES OF FLOW
25-30	Free Flowing
30-35	Good
35-40	Fair
40-55	poor
55-65	Very poor
>65	Extremely poor

Table No 5. Angle of repose

Bulk density: Calculated amount of the model drug was introduced in a 100ml graduated cylinder. Powder level was noted without compacting shows. Bulk density was calculated using the following equation:
Bulk density = M/V_o

Tapped density: Calculated amount of the model drug was introduced in a 100ml graduated cylinder. Mechanically the cylinder was tapped using the tapped density apparatus by raising the cylinder and allowing it to drop under its own weight that provides a fixed drop of 14±2 mm at a normal rate of 250 drops per minute. The cylinder was tapped 1250 times initially and tapped volume measured.

Tapped density was calculated using the following equation:
Tapped Density = (M)/Vf

Carr's index: This parameter is the measure of propensity of powder to be compressed and reflect the relative importance of inters particulate interaction.

$$\text{Carr's Index} = \frac{100(TD - BD)}{TD}$$

Hausner's ratio: The Hausner's ratio is a number that is used to correlate the flow ability of drug substance.

$$\text{Hausner's ratio} = \frac{\text{Tapped density}}{\text{Bulk density}}$$

Carr's Index	Flow character	Hausner's ratio
<10	Excellent	1.00-1.11
11-15	Good	1.12-1.18
16-20	Fair	1.19-1.25
21-25	Passable	1.26-1.34
26-31	Poor	1.35-1.45
32-37	Very poor	1.46-1.59
>32	Very, very poor	>1.60

Table No 6. Flow ability of powder on the basis of Carr's index and Hausner's Ratio

Post-compression parameters

Shape and color: Uncoated tablets were examined under a lens for the shape of the tablet and color was observed by keeping the tablets in light.

Thickness: The crown thickness of individual tablet may be measured with a vernier caliper, which permits accurate measurements and provides information on the variation between tablets. Other technique employed in production control involves placing 5 or 10 tablets in a holding tray, where their total crown thickness may be measured with a sliding caliper scale. The tablet thickness was measured using vernier caliper.

Hardness test: Tablets require a certain amount of strength, or hardness and resistance to friability, to withstand mechanical shocks of handling in manufacture, packaging and shipping. The hardness of the tablets was determined using Monsanto Hardness tester. It is expressed in Kg/cm2. Three tablets were randomly picked from each formulation and the mean and standard deviation values were calculated.

Friability test: It is the phenomenon whereby tablet surfaces are damaged and/or show evidence of lamination or breakage when subjected to mechanical shock or attrition. The friability of tablets was determined by using Roche Friabilator. It is expressed in percentage (%). Ten tablets were initially weighed (W initial) and transferred into friabilator. The friabilator was operated at 25 rpm for 4 minutes or run up to 100 revolutions. The tablets were weighed again (W final). The percentage friability was then calculated by,

$$F = \frac{W\,(initial)-W\,(final)}{W\,(initial)} \times 100$$

% Friability of tablets less than 1% is considered acceptable.

Weight variation test: The tablets were selected randomly from each formulation and weighed individually to check for weight variation. The U.S Pharmacopoeia allows a little variation in the weight of a tablet. The percentage deviation in weight variation is shown in table

Average weight of a tablet	Percentage deviation
650 mg (617.5 to 682.5 mg)	±32.5 (5%)

Table No 7:- Percentage deviation in weight variation

Assay: 20 tablets were accurately weighed and crushed in a mortar, a quantity of powder equivalent to label claim was disperse in methanol, shake and diluted to 100ml with methanol and filtered. 20m1 of the filtrate was diluted to 100ml with methanol. Absorbance was measured at 760nm in UV spectrophotometer. Calculation = Drug content/label claim x 100

In-vitro disintegration time: The process of breakdown of a tablet into smaller particles is called as disintegration. The in-vitro disintegration time of a tablet was determined using disintegration apparatus as per I.P. specifications.

Method: For a drug to be absorbed from a solid dosage form after oral administration, it must first be in solution, and the first important step toward this condition is usually the break- up of the tablet, a process known as disintegration. The disintegration time of chewable tablets was determined in accordance with the official "United status of pharmacopoeia Chewable tablets" stating a maximum disintegration time of 5 minutes (USP 36). One tablet in each of the 6 tubes of the basket is to be placed and the apparatus subjected to run. The assembly should be raised and lowered between 50 cycles per minute. The time in seconds taken for complete disintegration of the tablet with no palpable mass remaining in the apparatus was measured and recorded. Disintegration or more specifically dispersion times were measured in 900 ml purified water according to the I.P. method without using disc at room temperature (25°C ± 2°C).

Stability studies: Stability of a drug has been defined as the ability of a particular formulation, in a specific container, to remain within its physical, chemical, therapeutic and toxicological specifications. The purpose of stability testing is to provide evidence on how the quality of a drug substance or drug product varies with time under the influence of a variety of environmental factors such as temperature, humidity and light and enables recommended storage conditions, re-test periods and shelf lives to be established. In the present study, the Chewable Tablets are packed in suitable packaging and stored under the following conditions for a period as prescribed by ICH guidelines for accelerated studies.

(1)25 ± 2°C/60±5%RH
(2) 40 ± 2°C/75±5%

The tablets were withdrawn after period of 1, 2 and 3 Months and analyzed for physical characterization (Appearance, hardness, friability, disintegration etc) and drug content.

RESULT AND DISCUSSION

Extraction: Extraction with the ethanol solvent were performed, percentage yield and phytochemical analysis were done. The percentage yields of each extract are tabulated below.

S.no	Extract	Physical nature	Colour	Percentage Yield(%w/w)
1.	Ethanolic Extract	Solid Powder in nature	Pista Green to brownish in colour	9.6

Table No 8:- Percentage yields of Acalypha indica

Phytochemical screening

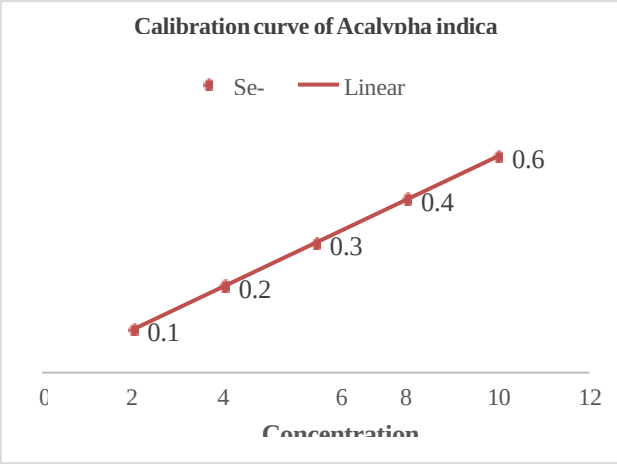
.no	Phytochemical constituents	Results
1	carbohydrates	-
2	Tannins	+
3	Alkaloids	+
4	Flavonoids	+
5	Saponins	-
6	Glycosides	+
7	Phenols	+
8	Steroids and Triterpenoids	-

Table No 9. Result of Phytochemical constituents

Pre-formulation studies
Solubility test Organoleptic properties

S.NO	SOLVENT	RESULT
1.	Water	**+**
2.	Methanol	**+**
3.	Ethanol	**+**
4.	Petroleum ether	**-**
5.	Chloroform	**-**
6.	Dilute NaoH	**+**
7.	Dilute .Hcl	**+**
8.	PEG	**-**

S.NO	ORGANOLEPTIC PROPERTIES	
1.	Appearance	Granular powder
2.	Colour	Sage green to Creamiest white colour
3.	Taste	Spearmint Oil
4.	Odour	Herbal Odour
5.	Melting range	155-157°C



Calibration curve of Acalypha indica

Concentration (µg/ml)	Absorbance at 540 nm
20	0.123
40	0.245
60	0.366
80	0.491
100	0.612

Table No 10. Pre-Formulation Studies

Identification of plant extract of acalypha indica by FTIR spectroscopy
Compatibility studies using FTIR spectroscopy

a) Powdered *acalypha indica*

S.No	Interpretation	IR absorption Bands cm^{-1}	
		Characteristic peak	Observed peak
1	O-H Stretch	3200-3600	3355
2	C-H Stretch	2850-2950	2911.51
3	C=C Stretch	1680-1820	1682.97
4	C-N Stretch	1000-1250	1222.45
5	C=O Stretch	1700-1900	1859.23

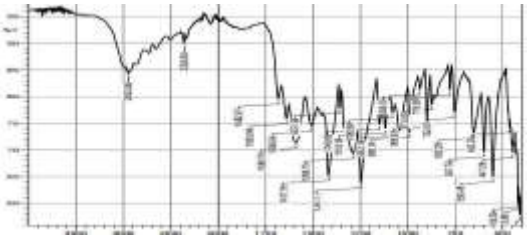
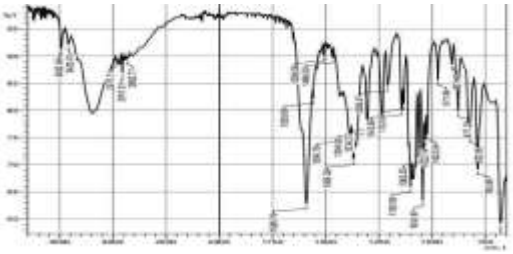


Table No 11. IR Interpretation of Powdered *Acalypha indica*

b) Powdered *Acalypha indica* + Microcrystalline cellulose

S.No	Interpretation	IR absorption Bands cm^{-1}	
		Characteristic peak	Observed peak
1	O-H Stretch	3200-3600	3346.23
2	C-H Stretch	2850-2950	2857
3	C=C Stretch	1680-1820	1818
4	C-N Stretch	1000-1250	1100.95
5	C=O Stretch	1700-1900	1733

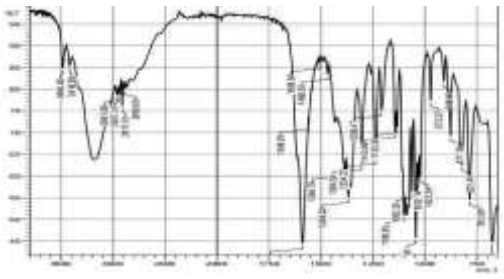
Table No 12. IR Interpretation of Pow-



dered *Acalypha indica* + Microcrystalline cellulose

c) Powdered Acalypha indica + Starch (Pregelatinized)

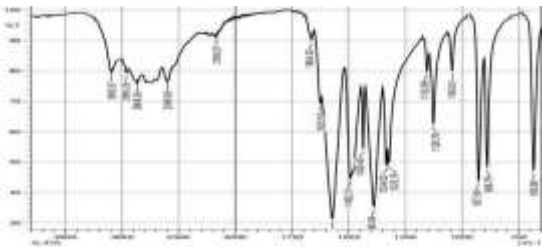
S.No	Interpretation	IR absorption Bands cm^{-1}	
		Characteristic peak	Observed peak



1	O-H Stretch	3200-3600	3256
2	C-H Stretch	2850-2950	2890
3	C=C Stretch	1680-1820	1791
4	C-N Stretch	1000-1250	1208.47
5	C=O Stretch	1700-1900	1834

Table No 13. IR Interpretation of Powdered *Acalypha indica* + Starch

d) Powdered Acalypha indica + Sucralose



S.No	Interpretation	IR absorption Bands cm^{-1}	
		Characteristic	Observed
1	O-H Stretch	3200-3600	3093.57
2	C-H Stretch	2850-2950	2672
3	C=C Stretch	1680-1820	1664.33
4	C-N Stretch	1000-1250	1126.76
5	C=O Stretch	1700-1900	1856

Table No 14. IR Interpretation of Powdered *Acalypha indica* + Sucralose

d) Powdered *Acalypha indica* + Sucralose

S.No	Interpretation	IR absorption Bands cm^{-1}	
		Characteristic peak	Observed peak
1	O-H Stretch	3200-3600	3093.57
2	C-H Stretch	2850-2950	2672
3	C=C Stretch	1680-1820	1664.33
4	C-N Stretch	1000-1250	1126.76
5	C=O Stretch	1700-1900	1856

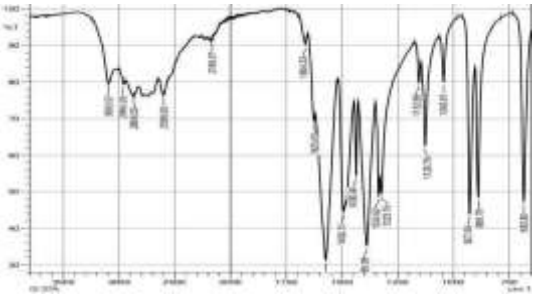
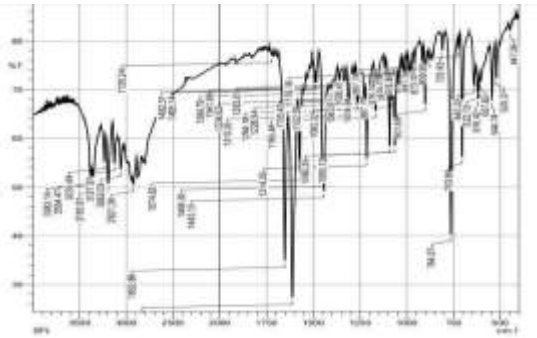


Table No 14. IR Interpretation of Powdered *Acalypha indica* + Sucralose

e) Powdered Acalypha indica+ Magnesium Stearate

Table No 15. IR Interpretation of Powdered *Acalypha indica* + Magnesium Stearate

S.No	Interpretation	IR absorption Bands cm^{-1}	
		Characteristic	Observed
1	O-H Stretch	3200-3600	3354.47
2	C-H Stretch	2850-2950	2927.28
3	C=C Stretch	1680-1820	1720.24
4	C-N Stretch	1000-1250	1065.12
5	C=O Stretch	1700-1900	1848



f) Powdered *Acalypha indica* + Mannitol

S.No	Interpretation	IR absorption Bands cm^{-1}	
		Characteristic peak	Observed peak
1	O-H Stretch	3200-3600	3282.23
2	C-H Stretch	2850-2950	2862.77
3	C=C Stretch	1680-1820	1688.24
4	C-N Stretch	1000-1250	1043.61
5	C=O Stretch	1700-1900	1862.77

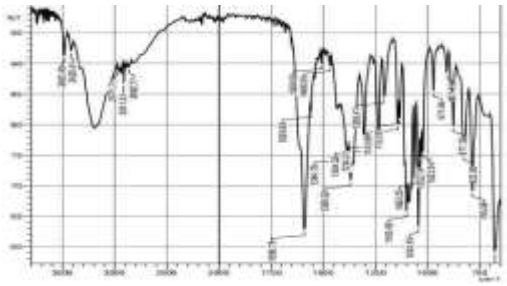


Table No 16. IR Interpretation of Powdered Acalypha indica + Mannitol

Evaluation of The Plant Extract
Parameters for Pre-Compression

The powder blends were evaluated for the following parameters such as Angle of repose, Bulk density, Tapped density, Carr's index and Hausner's ratio. The results were given below in Table

S.No	Parameters	Formulation-1	Formulation-2	Formulation-3	Formulation-4
1.	Loss on drying	1.11345%	1.56434%	1.36567%	1.26576%
2.	Tapped Density	0.628 gm/ cm^3	0.635 gm/ cm^3	0.630 gm/ cm^3	0.624 gm/ cm^3
3.	Bulk Density	0.521 gm/ cm^3	0.530 gm/ cm^3	0.524 gm/ cm^3	0.529 gm/ cm^3
4.	Hausner's Ratio	1.397	1.333	1.367	1.345
5.	Angle Of Repose	29.50 ^{o}	28.99 ^{o}	30.14 ^{o}	34.25 ^{o}
6.	Compressibility Index	28.40%	26.86%	20.38%	24.44%

Table No 17. Parameters for Pre-Compression

The Loss on drying of all formulations was found between 1.1-1.5% which indicates the for all the formulations the % LOD of the all formulations were found to comply within the limits specified and it should not affect the disintegration process of the formulations.The angle of repose of all formulations was found between 28.99-34.25^o which indicates the flow type of powder blend was passable.The flow properties of all the formulations are in the increasing order of Formulation-2 < Formulation-1 < Formulation-3 < Formulation-4.The bulk density was found between 0.521-0.530 g/cm3, tapped density was found between 0.624-0.635 g/cm3.Carr's index was found in the range of 20.38% to 28.40 % which indicates the for all the formulations the compressibility index of the formulations was found to comply within the limits specified and shown good compressibility index. Hausner's ratio ranges between 1.333 to 1.397. The above results in terms of micromeritics properties revealed that the flow property of all formulation was passable and within the acceptable limit.

Parameters for Post-Compression Description
The general appearance of all formulations (F-I to F-V) were examined and found that sage green to Creamiest white colour, Caplet Shape, and Smooth surface.

S.No	Parameters	Formulation-1	Formulation-2	Formulation-3	Formulation-4
1.	Hardness (kg /cm2)	5.99	6.82	6.23	6.34
2.	Thickness (mm)	6.00	5.99	5.87	5.96
3.	Friability (%)	0.17	0.19	0.29	0.20
4.	Weight Variation (mg)	647	651	646	648

Table No 18. Parameters for post-Compression

The hardness of the tablets was measured and the values were found in the range between 5.99 to 6.82 kg/cm^2.The thickness of tablets was measured and was found in the range between 5.87 to 6.00 mm. All the formulation possessed uniform thickness. Test all formulations of tablets passed the weight variation test since the values are within the acceptable variation limit (±20.0%) of the tablet. Similarly percentage friability values of the prepared chewable tablets showed less than 1% weight loss that is highly within the acceptable limit. Hence all the tablets passed the friability test.

Assay and Disintegration Time

Assay were determined by using ultra-violet Spectrophotometer with the wavelength of 540nm.

S.No	Parameters	Formulation-1	Formulation-2	Formulation-3	Formulation-4
1.	Disintegration Time (Min)	2 min 44 sec	2 min 59 sec	2 min 45 sec	2 min 57 sec
2.	Assay (%)	100.11	100.21	100.32	100.06

Table No 19. Result of Assay and Disintegration Time

Discussion:

The content of the chewable tablets was found in the range between 98.00 -102.00%. The results revealed that the content of Acalypha indica L extract was within the acceptable limits in all the formulations. Disintegration time of Acalypha indica L extract chewable tablets were found between 2.00 to 3.00 minutes. Specification limit of disintegration time for uncoated tablet from I.P is NMT 10 minutes.

Stability studies

The stability study was carried out for 3 months. In this study contains the sample was stored at 25±2°C/60%±5%RH and 40±2°C/75%±5%RH for a period of three months. The tablets were evaluated for various parameters like physical appearance, weight variation, thickness, hardness, friability, disintegration time and drug content at every month interval.

S.NO	Storage Conditions: 25±2°C/60%±5%RH				
	Parameter	**InitialPeriod**	**1st month**	**2nd month**	**3rd month**
1	Physical appearance	Sage green to Creamiest white colour	Sage green to Creamiest white colour	Sage green to Creamiest white colour	Sage green to Creamiest white colour
2	Weight variation test (mg)	651	652	651	650
3	Thickness (mm)	5.99	5.97	5.98	5.97
4	Hardness (Kg/cm^2)	6.82	6.81	6.79	6.79
5	Friability (%)	0.19	0.20	0.19	0.18
6	Disintegration time(min.)	2 min 59 sec	2 min 40 sec	2 min 38 sec	2 min 35 sec
7	Drug content	100.21	100.11	100.05	99.88

Table No 20:- Storage condition at 25±2°C/60%±5%RH-(Room Temperature)-Long Term stability condition

S.NO	Storage Conditions: 40±2°C/75%±5%RH				
	Parameter	**Initial Period**	**1st month**	**2nd month**	**3rd month**
1	Physical appearance	Sage green to Creamiest white colour	Sage green to Creamiest white colour	Sage green to Creamiest white colour	Sage green to Creamiest white colour
2	Weight variation test (mg)	651	649	648	647
3	Thickness (mm)	5.99	5.97	5.96	5.95
4	Hardness (Kg/cm^2)	6.82	6.80	6.78	6.78
5	Friability (%)	0.19	0.18	0.19	0.18
6	Disintegration time (min.)	2 min 59 sec	2 min 43 sec	2 min 36 sec	2 min 37 sec
7	Drug content	100.21	100.02	99.91	99.85

Table No 21. Storage condition at 40±2°C/75%±5%RH- Accelerated Term stability condition

Stability results revealed that there were no significant changes found in physical appearance, weight, thickness, hardness, friability, disintegration time, drug content a during the period of 3 months even after

stored at 25±2°C/60%±5%RH and 40±2°C/75%±5%RH. The results revealed that the drug was stable even after stored at 25±2°C/60%±5%RH and 40±2°C/75%±5%RH for three months.

CONCLUSION

The present study successfully developed and evaluated chewable tablets of Acalypha indica L leaves extract. All the pre compression parameters angle of repose, Carr's index, Hausner's's ratio, tapped and bulk density and % LOD are within the limits. The results shown that the formulations containing the powder have the good flow properties and the good compactability when compared with the other formulations.Post-compression evaluations, encompassing weight variation, hardness, friability, thickness, in vitro disintegration, in vitro dispersion time, demonstrated that the formulation Formulation-2, which included extract as the super disintegrant, performed the best. Specifically, Formulation-2 exhibited optimal values for all tested parameters, confirming its suitability for further development.The content of the chewable tablets was found in the range between 98.00 -102.00%. The results revealed that the content of Acalypha indica L extract was within the acceptable limits in all the formulations.Disintegration time of Acalypha indica L extract chewable tablets were found between2.00 to 3.00 minutes. Specification limit of disintegration time for uncoated tablet from I.P is NMT 10 minutes.Stability results revealed that there were no significant changes found in physical appearance, weight, thickness, hardness, friability, disintegration time, drug content a during the period of 3 months even after stored at 25±2°C/60%±5%RH and 40±2°C/75%±5%RH. The results revealed that the drug was stable even after stored at 25±2°C/60%±5%RH and 40±2°C/75%±5%RH for three months.

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