International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 04 Issue: 04 | April -2020 ISSN: 2582-3930

Formulation and Evaluation Of Hepato-protective Tablets From The Aerial Parts Of Balanites aegyptiaca Plant

Shoheb R.Bagwan[1], Shishir S.Badave[2],AbhijeetT.Naiknaware[4],Mayur M. Garje,

Dr.Arunadevi S.Birajdar[5]

[1]Student,K.T.Patil College Of Pharmacy,Osmanabad(MH)-413501(INDIA)

[2]Student,K.T.Patil College Of Pharmacy,Osmanabad(MH)-413501(INDIA)

[3]Student,K.T.Patil College Of Pharmacy,Osmanabad(MH)-413501(INDIA)

[4]Student,K.T.Patil College Of Pharmacy,Osmanabad(MH)-413501(INDIA)

[5]Associate Professor, K.T. Patil College Of Pharmacy,Osmanabad(MH)-413501(INDIA)

Abstract-present research work is to formulate and evaluate the hepato-protective tablets by using the aerial parts of plant B. aegyptiaca. The hepato-protective activity of the plant has already been confirmed by the research. [1][3] The present work is intended to formulate tablets from the plant of interest, The plant has been traditionally used by the village people but no attempt was made to convert it into a suitable dosage form. The prepared blend of granules was evaluated for angle of repose, Tapped density, Bulk density, Carr's index and Housner's ratio. The tablets were tested for hardness, Weight uniformity, friability. The obtained results were clearly indicating that the formulated tablets results are within the pharmacopoeial range. In vitro release kinetics were studied for tablets.

I. INTRODUCTION-

B. aegyptiaca plant is the plant with number of ,medicinal uses, Widely distributed in drier pats of India, Sudano-saheilian region of Africa and Middle East Asia.The plant grows 10 m in height .The leaves are alternate ,Two foliate , Petioles are 3-6 mm. long. Traditionally various parts of B,.aegyptiaca have been reported to have medicinal properties in different ethno-botonical surveys. [4] It finds place in Ayurvedic pharmacopoeia of India and has also been described in some monographs[4].

Biological source:

A) Botonical name: Balanites aegyptiaca
B) Family :Zygophyllaceae
C) Plant part used: Aerial parts.

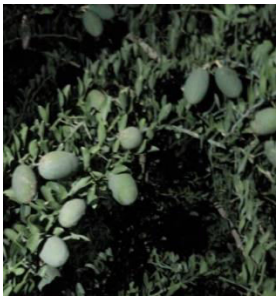


Fig 1 :Balanitesaegyptiaca fruits

D) Common names:Hingot,Hinganbet,Balanites

II. MATERIAL AND METHOD

Material: The plant b. aegyptiaca was collected from the village near barshi subdistrict..Required excipients were purchased from Rajesh Chemicals, Mumbai.

***Method*:**1)Processing of crude drug: The collected crude drug was shed dried for seven days ensuring that it doesn't get exposed to direct sunlight to avoid any possible loss of drug content .Later the superior aerial parts were chosen for the experimentation,

2)Granulation: The crude drug powder was powdered and passed through suitable mesh. The granules were prepared by using wet granulation method.

Initially, The powdered crude drug was blended with suitable excipients.

The calculated amount of blend (For 20 tablets) was then transferred to a previously weighed china dish .The china dish was heated simultaneously few ml of alcohol (ethanol) was sprinkled to promote formation of damp mass. The heating was continued until the damp mass was formed. The formed granules were passed through sieved number 60.The moisture content was removed by keeping the prepared granules in hot air hot air oven. After ensuring that all the moisture is removed from from granules, the punching was done to form tablets.

Table No: 1. Formulation of Tablets:

Sr. No	**Ingredients**	*Quantity (%)*
1.	Lactose	74
2.	Starch	10
3	Magnesium stearate	8
4.	Talc	7
5.	Methyl paraben[5]	0.2
6.	Aerial parts of plant	0.8
7.	Ethanol	qs

C. PRECOMPRESSION PARAMETERS: The prepared blend was evaluated for following parameters before the compression

Bulk Density: Apparent bulk density was determined by pouring the 5 gm of powder into a 100 ml graduated cylinder. The bulk volume (V) of the poured drug was determined and the bulk density was calculated using the formula.

Db = M / Vb

Where Db is bulk density, M is weight of the powder and Vb is bulk volume of the powder.

Tapped Density : Measuring cylinder containing known mass (5 gm) of powder was tapped for 100 times. The minimum volume (Vt) occupied was measured. The tapped density was calculated using following formula8.

Dt= M / Vt

Where; M is the mass of powder and Vt is the tapped volume of the powder

Carr`s Index: It indicates powder flow properties. It is expressed in percentage and is given as

I = Dt – Db / Dt× 100

Where; Dt is the tapped density, Db is the bulk density of the powder

Hausner Ratio: Hausner ratio is an indirect index of ease of powder flow. Hausner ratio is the ratio of tapped density to bulk density. Lower the value of Hausner ratio better is the flow property. Powder with Hausner ratio less than1.18, 1.19, 1.25, 1.3- 1.5 and greater the 1.5indicate excellent, good, passable, and verypoor, respectively. It was calculated bythe following formula8.

Hausners ratio = Dt / Db

Where; Dt is the tapped density and Db is the bulk density

Angle of repose: The angle of repose was determined using funnel method. Funnel was kept vertically with stand at 6.3 cm. height. The opening end of funnel was closed with thumb and 5 gm of powder was poured into funneluntil a maximum cone height (h) was obtained vertically. Radius of the heap (r) was measured and the angle of repose (θ) was calculated using the formula.

θ = Tan-1(h / r)

Where; θ= Angle of Repose, h = height of the cone and r = radius of the cone

III. EVALUATION TESTS FOR HEPATOPROTECTIVE TABLETS

A)Physical identification:

a).Color: White

b).Odor: Odorless

c) pH: 6.5 (Tablet is neutral to litmus)

d)Stability: Stable

The tablets were exposed to open environment for means of checking the probable hygroscopicity tablet; No such observations were noted.

B) Weight variation: Weight variation test is performed to check that the manufactured tablets have an uniform weight. As per IP twenty tablets are weighed individually and compound weight was taken, the average weight was obtained by dividing the compound media weight by twenty, now the average weight is compared to individual weight of the tablet. For a tablet to pass the tests not more than two tablets should lie out of the specified percentage (0.2).

C) Friability:

Fig No:2. Friability test

Friability of the tablets was determined using Roche friability (Electrolab, Mumbai). This device subjects the tablets to the combined effect of abrasions and shock in a plastic chamber revolving at 25 rpm and dropping he tablets at a height of 6 inches in each revolution. Preweighed sample of tablets was placed in the friabilator and were subjected to100 revolutions. Tablets were de

dusted using a soft muslin cloth and reweighed. The friability (f) is given by the formula.

D) Hardness:

Fig No:3. Hardness testing

It is the force required to break a tablet by compression in the radial direction, it is an important parameter in formulation of ODTs because excessive crushing strength significantly reduces the disintegration time. In the present study the crushing strength of the tablet was measured using Pfizer hardness testers. An average of three observations isreported.

E)Dissolution :

Fig No:4. Dissolution testing

As per IP disintegration apparatus consist of 6 glass tubes with a 10 number mesh at bottom, each tube is 3 inch long. This arrangement of 6tube is placed in medium simulated to the disintegration environment. This is maintained at 37+/- 2 degree Celsius, in 1 liter vessel of paddle type apparatus.

U.V ANALYSIS: The UV analysis is done to check the release pattern of drug in to solution. The data is recorded as below under UV cabinet.

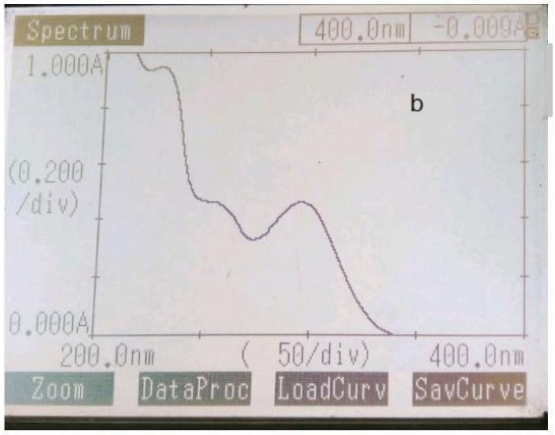


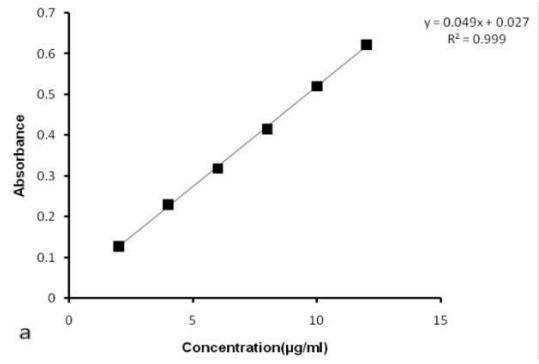
Fig 5:Absorbance maxima at 0.1N HCL.

Dissolution Data:

Sr. No	Time(min)	Avg. % Release
1	5	37.89
2	10	46.96
3	15	52.67
4	20	58.29
5	25	64.25
6	30	75.64
7	35	80.32
8	40	84.9
9	45	91.78
10	60	99.80

UV VISIBLE ANALYSIS: The UV visible analysis was based on absorbance of UV radiations by the

substance where the absorbance is proportional to amount of absorbing substances.



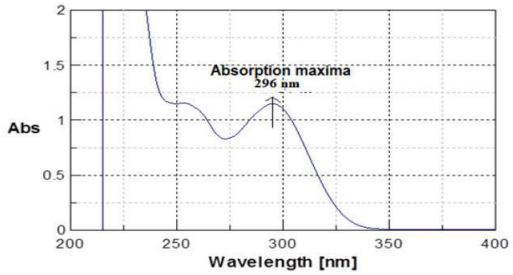
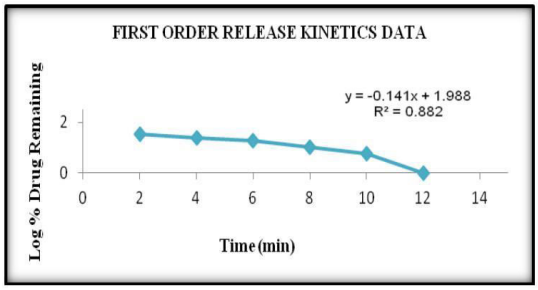


Fig.UVvisible data

F). Disintegration: disintegration is defined as the process of breakdown of tablet into small particles. Disintegration time of a tablet is determined by using disintegration test apparatus containing disc to each tube containing liquid media containing 0.1N HCl. The temperature of the media was maintained at about 37+/- 2 degree Celsius and run the apparatus at speed of 30 cycles per minutes. The time required for disintegration was noted.

KINETIC MODELING OF DRUG RELEASE: In order to describe the release kinetics of formulations the corresponding dissolution data was fitted in various kinetic models like zero order and first order .Here the tablet followed first order kinetics and drug release described by dissolution will vary with the change in surface area and the diameter of the tablet.



IV. RESULT AND DICUSSTION:

The hepatoprotective tablets from the plant of interest were prepared using the wet granulation method. The final formulation was tested for its quality by various standard evaluation tests; Initially for granules and then for tablet.

Table :3. Evaluation test and result:

Evaluation tests	Results
Color	White
Odor	Odorless
pH	6.5
Friability	Weight loss- 0.55% of initial weight.
Weight variation	Not more than two tablets shown variation in weight(when compared with standard)
Dissolution	18min. (0.1N HCl)
Hardness	3.50kg/square inch

F) Average Weight:I.P. procedure for uniformity of weight was followed. Twenty tablets were taken and their weight was determined individually and collectively on a

digital weighing balance. The average weight of one tablet was determined from the collective weight. The weight variation test would be a satisfactory method of determining the drug content uniformity.

G)Thickness: Tablet thickness can be measured using a simple procedure. 5 tablets were taken and their thickness was measured using Vernier caliper

H)Disintegration Time: The process of breakdown of a tablet into smaller particles is called as disintegration. 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 recorde

I)Drug Content Uniformity Test: The tablets were weighed and powdered. An amount of powder equivalent to 150 mg of Telmisartan was dissolved in 100 ml of phosphate buffer pH 6.8, filtered, diluted suitably and analyzed for drug content at 296 nm using UV-Visible spectrophotometer. From the absorbance values, amount of drug present in the given tablet was calculated.

J)Wetting Time: Five circular tissue papers of 10 cm diameter were placed in a petridish with a 10 cm diameter. Ten milliliters of water containing Eosin, a water-soluble dye, is added to petri dish. A tablet was carefully placed on the surface of the tissue paper. The time required for water to reach upper surface of the tablet was noted as a wetting time.

K)Water Absorption Ratio: A piece of tissue paper folded twice was placed in a small Petri dish (internal diameter = 6.5 cm)containing 6 ml of water. A tablet was placed on the paper and time required for complete wetting was measured. The wetted tablet was then weighed. Water absorption ratio (R) was determined using following equation:

R= 100 x {)/ Wb}

Where; Wa - Weight of tablet after water absorption, Wb - Weight of tablet before water absorption.

V. CONCLUSION AND SUMMARY:

The plant with notable hepatoprotective properties was not in use just because of void of attempts to formulate it into a suitable dosage form so that people could use it. Various researches were evident that the plant posses the hepatoprotective property but to use it efficiently a suitable dosage form was needed. The tablet form of this crude drug was tested and found to meet all the requirements for tablets.

VI. REFERENCES:

[1] Ojo O. O, Nadro M. S, Protection of rats by extract of some common Nigerian trees against acetaminophen induced toxicity. Afr J Biotechnol.2006;755-60

[2] Chotani D. L.,Vaghasiya H. U-Phytochemical constituents,Traditional uses and pharmacological activity of B. aegyptiaca.Pharmacognosy reviews.2011;5(9);55

[3] Yadav J.P , Panghal M. A review of traditional uses , Phytochemistry and pharmacological properties of B. aegyptiaca. International journal of green pharmacy.2010 Jul;4:140

[4] Khare C. P. Indian medicinal plants- An illustrated dictionary first Indian reprint Springer (India) Pvt. Ltd, New Delhi,India.2007-28.

[5]Gowthamarajan K; Singh SK. Dissolution Testing for Poorly Soluble Drugs: A Continuing Perspective. , Dissolution Technol. 2010, 17(3), 24–32.

[6]Dissolution Testing of Immediate Release Solid Oral Dosage Forms; Guidance for Industry; U.S. Department of Health and Human Services, Food and Drug Administration, Center for Drug Evaluation and Research (CDER), U.S. Government Printing Office: Washington, DC. 1997

[7]Qureshi SA; Developing Discriminatory Drug Dissolution Tests and Profiles: Some Thoughts for Consideration on the Concept and Its Interpretation. Dissolution Technol. 2006, 13(4), 18–23.