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Formulation and Assessment of a Polyherbal Tablet Comprising Indigenous Herbs of Korba Region Chhattisgarh Herbal State

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ABSTRACT –

The current study focusses on creating and assessing a polyherbal tablet with indigenous Korba area medicinal plants. In four formulations (F1–F4), different concentrations of powdered Sonth, Shilajit, Ashwagandha, Shallaki, Ajwain, Nirgundi, Dalchini, Parijat, Baividang, and Guggul were utilised. Polyvinyl Pyrrolidone (PVP) in isopropyl alcohol served as a granulating agent, while guggul and acacia were used as binders. Wet granulation was used to create the granules, which were then dried and compacted into tablets. Pre-compression characteristics such as bulk density, tapped density, angle of repose, Carr's index, Hausner's ratio, and drying loss were assessed for the formulations. Weight fluctuation, thickness, diameter, hardness, friability, disintegration time, and organoleptic properties were all assessed after compression. While F3 had the most constant weight variation (309±1.01 mg) and acceptable hardness, F1 had the shortest disintegration time (24±0.02 minutes) of any formulation. Additionally, the in vivo paw oedema test, which measures anti-inflammatory action, showed that F4 (100 mg) significantly inhibited the effects of other doses. According to the findings, traditional herbs can be used in conjunction with contemporary pharmaceutical methods to create stable, palatable polyherbal tablet formulations that may have therapeutic benefits.

Keywords – Polyherbal, Disintegration, Formulations, Wet Granulation

Introduction –

In flora chemicals mediate their results at the human body thru procedures same to those already nicely understood for the chemicals in traditional pills, hence herbal medicines do not differ greatly from traditional tablets in phrases of the way they portraits. This allows natural drug treatments to be as powerful as traditional drugs, but also gives them the equal capacity to cause harmful aspect results. From the time immemorial, plant life were used as medicine (1-2). To discover destiny drug treatments, ethnobotany (the observe of traditional human uses of plants) is identified as an effective device. From "ethnomedical" plant sources 122 compounds have been identified in 2001, that had been used as present day medicinal drug, approximately (80%) of the plants had an ethnomedical use equal or related to the modern use of the active factors of the plant (3-4). The gift situation of world market is in urgent need of standardized and reproducible natural arrangements, which may be accomplished with the aid of the method of modern-day natural dosage bureaucracy and their assessment by using present day strategies. Solid oral dosage bureaucracy constitute the desired elegance of product for orally administered capsules (5-6).

The cutting-edge tendencies for surviving lengthy and healthful existence completely dependent on the conventional medicinal drug structures wherein Ayurveda is one of the most beneficial structures because of it possess several herbal elements to cast off the vital causes of the disease by means of restoring the equilibrium and stopping further reoccurrence. WHO envisioned that round 80% of the arena's populations nevertheless trusting in traditional or Ayurvedic drugs for their wholesome survival of existence . The Indian philosophy at the back of Ayurveda is to prevent needless struggling of survival whilst curing the human illnesses and also famous for the full-size biodiversity centers through concerning 45,000 natural plant species out of which approximately 15,000 medicinal plant life had been recorded to curing exclusive human illnesses by means of the usage of unmarried or a couple of herbs for the complete elimination of disorder(7-10)

The combination of various herbs (polyherbal) in a specific ratio will give a ideal healing effect due to the fact the mighty phytochemical constituents of man or woman vegetation are inadequate to attain the useful effect. The polyherbal formulation incorporates or greater herbs with distinct phytoconstituents possessing similar or assorted healing potential had been collectively producing suited outcomes during the control of human ailments. The recognition of the polyherbal method is outstanding due to their huge therapeutic range i.e., effective at a low dose and safe at excessive dose, even though produces fewer facet consequences whilst misused(11-14)

Methodology

Pre Compression Parameters

Bulk Density - It was determined with the aid of setting the powders mixture in a measuring cylinder and the overall volume turned into referred to .The weight of powder mattress determined by using the use of digital weighing stability. Bulk density became calculated by formula(15-16).

Bulk Density = weight of powder/Bulk extent of powder

Tapped Density

Tapped density was determined through taking the dried powders in a measuring cylinder and measures the extent of powder after 300 tapping and take weight of the entire powder(17-18).

Tapped Density = weight of powder/tapped quantity of powder

Angle of Repose

Angle of repose become determined by measuring the peak and radius of the heap of the powder mattress. A cylinder side open tube of 6cm duration is area on graph paper , powders are located within the tube and slowly removed the tube vertically with the assist of scale the height and radius of the heap had been degree and noted(19-20).

θ = tan-1 h/r

Where h = top of heap of granular bed

R = radius of heap of granular bed

Carr's index

The percent compressibility of the powder mixture became decided by means of the following formula(21-22).

Carr's index = Tapped density – Bulk density /tapped density × one hundred

Hausner's ratio

It is the size of frictional resistance to the drug. The ideal variety have to be 1.2- 1.Five. It is decided by means of the use of the subsequent method It is expressed in percent by means of (23-24)

H = Dt/Db

Where Dt is the tapped density of the granule

Db is the majority density of the granule

Loss on drying

One gram of granules became transferred into a dried, glass stoppered shallow weighing bottle. The contents were distributed frivolously and positioned inside the drying chamber. The stopper become eliminated from the bottle and the contents have been dried for a special time to attain a steady weight(25-26).

Loss on drying (%) = [(Initial weight – Final weight) / (Initial weight)] X one hundred

Preparation of Polyherbal Tablet

The powdered of Sonth, Shilajit, Aswagandha, Shallaki, Ajwain, Nirgundi, Dalchini, Parijat, Baividang, and Guggul were weighed accurately for the formulation of tablets. Acacia and Guggul were delivered to the aggregate and mixed thoroughly for 5 mins. Polyvinyl Pyrrolidone (PVP) was dissolved in sufficient quantity of isopropyl alcohol (IPA) till it bureaucracy a solution and this became introduced to the drug mixture and mixed thoroughly to shape a coherent mass. Then the coherent mass become passed via Sieve No: 16 to form granules and the accrued granules have been dried at 40 °C ± 2°C for two hours. The dried granules were exceeded via sieve No: 22. The granules retained on sieve No: 22 were used for compression of tablets(27-31) .

Table no. 01 Composition of Polyherbal tablet

Composition	**Formulation of Polyherbal tablet**			
	F1	**F2**	**F3**	**F4**
Mixed herbs (Sounth, Ashwagandga, Ajwain, Dalchini, Shilajit, Shailaki, Nirgundi, parijat, lavidang, Guggul)	25	50	75	100
Starch	20	20	20	20
Magnesium stearate	5	5	5	5
Acacia gum	5	5	5	5
Talc	5	5	5	5
Lactose	340	315	290	265

Evaluation

Weight version test

20 capsules had been taken and their weight was decided individually and collectively on a digital weighing stability. The average weight of 1 tablet is decided from the collective weight(32-33).

Weight version =Weight of each tablet-average weight of pills/common of tablet × one hundred%

Thickness

The pills were evaluated for his or her thickness the use of a vernier calliper measured in phrases of micrometre. Average of 3 readings had been taken and the outcomes were calculated(34-36).

Diameter

The diameter of the pills were discovered out with the assist of vernier callipers. From every batch four capsules have been taken for check(37-40)**.**

Hardness test

The hardness of the tablet from each formulation turned into decided the usage of Monsanto hardness tester. The hardness became measured in terms of kg/cm2(41-43).

Friability

Friability of the pills become decided the usage of Roche Friabilator. This tool subjects the drugs to the combined effect of abrasion and surprise in a plastic chamber revolving at 25 rpm and losing the pills at a top of 6 inches in each revolution. Pre weighed sample of drugs was positioned inside the friabilator and have been subjected to 100revolutions. Tablets were reweighed. The friability (f) is given by way of the components(44-45).

Friability = Initial weight – Final weight initial weight × 100

Disintegration Test

Glass of plastic tube [80-100 mm] long with an internal diameter [28 mm] and outside diameter [30-31 mm] geared up at the lower give up with a disc of rust evidence twine gauge. Six capsules were positioned inside the tube, the tube was raised and lowered in any such manner that the complete up and down movement become repeated [28 to 32] per min. The capsules have been disintegrated when no particle remains above the gauge, which without problems skip thru mesh (10 mesh display)(46-50).

Result and Discussion

Pre-compression characteristics were investigated for all 4 formulation and the study showed following results. Bulk density and tapped density of different formulations were calculated. The result of bulk density range from 0.31 to 0.41 and tapped density from 0.39 to 0.43. Angle of repose showed good flow properties of the powdered blend compressibility index of granules was significant and Hausner's ratio was also significant. The average weight of entire tablet was found in the range between 309±1.20 to 320±1.85 reported. Twenty tablets from all the formulations were used for standard deviation all batches passed the test.The thickness of the tablet varied from 0.2±0.25 to 0.3±0.34 cm showed in table. The thickness of all batches with low SD value indicates significant result. The diameter of the tablet varied from 5.1±0.10 to 5.4±0.54mm showed in table this confirms the batches passed the test.The hardness of tablet varied from 4.25±0.29 to 6.57±1.28 kg/cm^2 showed in table. The hardness of all the batches showed low standard deviation. The friability of tablet varied from 0.1±0.12 to 0.8±0.02 showed in table. The friability of all the batches with low SD indicates strength of prepared tablet in the standard criteria. The disintegration time of formulations ranged from 24min 50sec to 27min 10sec.F1 was found to be suitable as it requires less time to disintegrate

Table no.02 Organoleptic characters

S.No	Property	Observation
1	Colour	Greenish
2	Odour	Odourless
3	Shape	Oblong
4	Touch & Texture	Hard & Rough

Table no. 03 Result of Pre-Compression Parameters

S.No	Bulk Density (g/ml)±SD	Tapped Density (g/ml)±SD	Angle of repose (θ)±SD	Carr's Index (%)±SD	Hausner's Ratio (g/ml)±SD	Loss on drying (%)±SD
F1	0.38±0.02	0.40±0.03	28.09±0.29	12.29±0.76	1.14±0.05	0.96±0.007
F2	0.31±0.02	0.39±0.02	30.32±0.09	14.34±1.06	1.15±0.03	0.99±0.012
F3	0.41±0.03	0.43±0.02	29.75±0.21	11.93±1.50	1.18±0.04	0.980±0.002
F4	0.36±0.01	0.40±0.03	30.18±0.06	17.19±0.98	1.16±0.05	0.95±0.019

***Values are mean value of 3 observation(n=3) and Standard Deviation (±SD)**

Table no. 04 Post compression Parameters of Polyherbal tablet

Formulation	Hardness (Kg/cm^2)±SD	Thickness (cm) ± SD	Diameter (mm) ± SD	Friability % ± SD	Weight variation (mg ± SD)
F1	4.25± 0.29	0.3±0.34	5.4 ±0.12	0.1±0.120	310 ±1.05
F2	4.75±0.32	0.2±0.25	5.1±0.34	0.56±0.02	315±1.003
F3	5.25± 0.58	0.2±0.25	5.4±0.54	0.2±0.01	309± 1.20
F4	6.57±1.28	0.3±0.34	5.2±0.95	0.8±0.02	320 ±1.85

Table no. 05 Disintegration Data

Formulation	Disintegration time (min) ± SD
F1	24±0.02
F2	25 ±0.01
F3	27 ±0.03
F4	26 ±0.05

Conclusion –

From this study it is concluded that using traditional knowledge and the recent technologies, the medicinal plants can be prepared in the form of cost effective tablet formulations to improve their stability, consumer compliance and acceptability. The prepared polyherbal tablet were evaluated for precompression parameters bulk density ,tapped density , Angle of repose , Carr's index ,Hausner's ration and loss on drying . It was also evaluated for weight variation test , hardness , friability and disintegration test and invivo paw edema test . Formulation F3 showed minimum weight variation of 309±1.01. Hardness of formulation F1, F2 & F3 showed minimum deviation which indicates uniformity. The formulation F1 showed minimum time to disintegrate. In anti- inflammatory paw edema test, F4 (100mg.) showed significant anti-inflammatory action as compared to formulation I (25mg), II (50mg), and III (75mg). It can be concluded that development of Polyherbal tablet have a great potential for oral drug delivery.

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