

# Formulation And Evaluation of Nutraceutical Tablets By Herbs

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**Abstract-** A nutraceutical is bearing to have a various physiological benefit or giving protection against chronic disease. The main goal of this study was to develop and assess a wet granulation method-prepared nutraceutical herbal tablet. The effective formulation of the crude drugs used in this study included Orange peel, Cinnamon, Ginger, Liquorice, Tulsi, and Mentha. It also included chemical constituents such as Ascorbic acid, Cinnamaldehyde, Gingerol, Glycyrrhizic acid, Eugenol, and Menthol. The precompression parameter of the prepared granules was assessed. The post compression parameter was then assessed for the prepared tablet. The tablet's weight variation, hardness, thickness, friability, and disintegration test results were assessed. UV visible spectrophotometer was used to evaluate their dissolving properties.

**Keywords-** Nutraceutical, Chronic disease, Wet granulation, Herbal tablet, Orange peel, Cinnamon, Ginger, Liquorice, Tulsi, Mentha, Precompression, UV Spectrophotometer.

## I. INTRODUCTION

Nutrition is a major factor in bringing out the maximum potential that one is endowed both physically and mentally. The main causes of widespread malnutrition are inadequate diets and bad lifestyles. One of the main benefits of viewing hunger as an issue in human ecology is that it opens up a wide range of potential preventative strategies. Living organisms take nutrients in the form of food for growth, function, digestion and metabolism to maintain health. Body building food rich with nutrients are essential for building new cells, replacing dead cells with new cells. It also fills the body by increasing the body. Such food components are nitrogenous foods. Our experience has shown us that different persons react differently to the same cuisine. Similar to how people differ in their preferences for certain foods, so do their needs for certain foods in terms of quantity and quality. These days we don't get proper nutrition from food so to fulfill these needs of nutrients we have to consume some nutrients externally in the form of tablet/pills or powder or capsules. Herbal nutritional pills are a union of modern nutritional research with traditional herbal expertise. By utilizing the medicinal qualities of plant-based extracts, these pills provide

a practical and easily obtainable way to increase food consumption and target particular health issues. These tablets, which are designed to enhance immunity, strengthen cognitive function, or enhance general well-being, represent the holistic philosophy of traditional herbal therapy while adhering to the strict guidelines of contemporary nutritional supplementation. Nutritious herbal tablets are appealing due to their natural origins as well as their alleged safety and efficacy. These tablets, which are based on contemporary clinical research and centuries of empirical data, have the ability to function as stand-alone interventions in preventative health management or as supplements to traditional healthcare methods. Furthermore, the botanical components of these substances frequently contain a wide range of bioactive substances, such as flavonoids, phytochemicals, and polyphenols, which have a variety of physiological effects on the body. But in the booming world of nutritional supplements, both health professionals and astute customers must navigate a plethora of options and decisions. Concerns about the quality of the product, extract standardization, active component bioavailability, and possible herb-drug interactions highlight the necessity of careful examination and evidence-based decision-making. Purpose to formulate this tablets is to fulfill some nutrients in our body that we don't get from daily diet. The mixture includes polyherbs such as mint, licorice, cinnamon, ginger, orange peel, and tulsi leaves. It has demonstrated a range of pharmacological actions without any negative side effects. Orange peel is a fantastic food source since it has important vitamin C and minerals that are needed for our bodies to function properly as well as for the prevention of many common illnesses. The mint is good source of Vitamin A, a fat-soluble vitamin that is essential for healthy eyes and night vision. Also mint helps in Treat Indigestion, Relieve Irritable Bowel Syndrome, Improve Respiratory Complaints, Oral Care, Improve Brain Power, Boosts Immunity, Beats Stress & Depression, Help in Breastfeeding Pain. Licorice helps in digestive problems, menopausal symptoms, cough, and bacterial and viral infections. Cinnamon bark may lower your total cholesterol, LDL (or bad) cholesterol, triglycerides, and blood sugar if you have metabolic disease. Ginger aids in digestion and relieves nausea, diarrhea, and upset stomachs. In addition, ginger has been used to treat heart problems, colic, arthritis, and diarrhea.

Tulsi is rich in Zinc and vitamin C. As a result, it prevents infections and boosts immunity naturally. Its powerful antibacterial, antiviral, and antifungal qualities shield us against a wide range of infections.

### Materials and methods:

#### Materials:

The herbs used are Orange peel, Tulsi leaves, Cinnamon bark, Mint leaves, Licorice, Ginger. Lactose, Magnesium stearate and starch powder were used as excipients.



#### Methods:

Take orange peel, tulsi leaves, ginger, licorice, mint leaves and cinnamon bark and dry it fully till it becomes able to make powder. Grind each to become powder. Take 185mg orange peel powder, 90mg tulsi powder, 25mg ginger powder, 30mg cinnamon powder, 5mg mint, 30mg licorice powder. 100mg lactose, 40mg starch powder, magnesium stearate 5mg.

#### Preparation:

- After carefully weighing each of the necessary powdered mixes.
- they were all put through a standard sieve (sieve no. 80).
- blended for five minutes. then the wet granulation procedure was used to turn the combined powders into granules.
- The pre-evaluation metrics for the granules included bulk density, tapped density, Hausner's ratio, angle of repose, and compressibility index (Carr's index).
- Compression was used to create nutritional herbal tablets via a single punch tablet press machine.
- Yellowish-brown tablets with an average mass of 500 mg were obtained.

- The formulation was subjected to the post-evaluation criteria, which included weight variation, hardness, ph, friability, dissolution, and disintegration tests.

### Evaluation of pre-compressional blend:

#### Angle of repose:

The fixed funnel method was used to measure the angle of repose. The fixed funnel method involves placing a funnel above graph paper that is laid out flat on a horizontal surface, with its tip fixed at a specific height,  $h$ . Granules were gradually added to the funnel until the funnel's tip was touched by the peak of the conical pile.

$$h / r = \tan \theta$$

where  $\theta$  is the angle of repose and  $r$  is the radius of the conical pile's base.

#### Bulk density:

The ratio of the granule's bulk mass to bulk volume is known as the bulk density.  $\rho_b$  serves as its denotation. The homogeneity of the specified sample can be ascertained using the bulk density.

$$M/V_b = \text{Bulk Density } (\rho_b) \text{ where } V_b \text{ is the bulk volume and } M \text{ is the sample's mass.}$$

#### Tapped density:

The ratio of the granules' weight to the least amount of space occupied in the measurement cylinder is known as the tapped density. A graduated cylinder with a known mass of medication or the formulation is placed on a mechanical tapper device and turned on at a fixed number of taps (100) until the powder bed reaches a minimum volume. This is how it is calculated.

$$\text{Weight of the powder blend} / \text{Minimum cylinder volume} = \text{tapped density } (\rho_t)$$

#### Carr's index:

The provided formula was used to calculate the % compressibility of the powder mixture based on the apparent bulk density and tapped density. Carr's index, for example, is equal to  $(\text{Tapped density} - \text{Bulk density}) \times 100 / \text{Tapped Density}$ .

#### Hausner's ratio:

A lower Hausner's ratio (<1.25) indicates better flow qualities than a higher one (>1.25). Hausner's ratio is defined as an indirect indicator of the ease of measuring powder flow. It is provided by the equation.

Tapped density / Bulk density equals Hausner's ratio.

### Evaluation parameters of tablets:

Tablet dimensions:

A calibrated dial calliper was used to measure the thickness and diameter of ten tablets that were chosen at random from each formulation.

Weight variation:

A random selection of twenty pills was made from the formulation. Each tablet was weighed individually, and the average weight was then determined. Each tablet's divergence from the average weight was determined, and the percent deviation was then computed.

Tablet hardness:

Using the Veego hardness tester made by Monsanto, the hardness was assessed.

PH of solution:

Using a pH metre, the pH of the solution was measured with one tablet in 100 millilitres of filtered water at 10 ± 1 °C as soon as the dissolve period was up.

Friability testing:

Friability apparatus is used to conduct the friability test. The device is filled with weighted tablets and rotated for five minutes at a speed of 25 revolutions per minute. Tablets are removed from the equipment and weighed again after a break. The provided formula is used to calculate the friability. Friability = Initial weight (Wi) – Final weight (Wf)/Initial weight (Wi) \*100

Disintegration test:

To estimate the disintegration time, three pills were taken. After the pills were put in the disintegration device, the amount of time it took for the tablets to completely dissolve was noted. The apparatus's temperature was kept constant at 37° C.

## II. RESULTS AND DISCUSSION

Four batches of tablets containing crude medicines, such as orange peel, cinnamon, ginger, licorice, tulsi, mentha, etc., were made for tablet formulation. These are the primary components utilised in the production.



### Evaluation of Granules:

Sr.no	Evaluation parameters	Results
1	Angle of Repose (°)	21.3
2	Bulk density (g/ml)	0.45
3	Tapped density (g/ml)	0.40
4	Carr's index	11.5
5	Hausner's ratio	1.200

Table: Evaluation parameters of granules

### Evaluation parameters of tablets:

Weight variation, friability, hardness, thickness, were among the evaluation criteria conducted for the tablets are displayed in Table.

Sr.no.	Evaluation parameters	Results
1	Thickness (mm)	5.7
2	Hardness (kg/cm <sup>2</sup> )	6
3	% Weight Variation	2.9
4	Friability (%)	0.3

## III. CONCLUSION

Based on the aforementioned investigation, we can infer that the wet granulation process was utilised to make the nutritional herbal tablets, yielding a satisfactory and acceptable outcome.

Additionally, it was determined that the cost-effective formulation of the nutraceutical herbal tablet will reduce patient compliance by suppressing adverse effects and improving beneficial benefits on the body.

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