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## **Formulation and Evaluation of Herbal Immunity Booster Tablets**

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### **ABSTRACT**

The immune system defends the host against pathogenic organisms including bacteria, viruses, fungus, etc. There are two kind of immunity or bodily defence mechanisms: natural and specialised. This study was planned to investigate the immunomodulatory effect of Immunity Booster Tablets. Immunity Booster have many herbs like Giloy, Turmeric, Tulsi, Black pepper, Liquorice, etc. which are used for immunomodulatory effects. Various research has been done in the past as well as are going on presently for immunity enhancing. Present invention of Herbal Immunity booster tablet triturates were developed by using well documented medicinal plants like *Tinosporacordifolia*, Pepper *Nigrum*, the dried rhizome of *Curcuma longa* Linn., Tulsi consists of the fresh and dried leaves of *Ocimum* species like *Ocimum sanctum* L. and *Ocimum basilicum* L and Liquorice consists of peeled and unpeeled roots, stolons, stem of *Glycyrrhizaglabralinn*. It is also crucial to ingest immune-boosting supplements, such as zinc, vitamin B-complex, vitamin A, C, D, and E, which will help your body fight pathogens. The formulation and evaluation of herbal immune booster tablets triturates made from selected plants and dried plant extract with acacia gum as a binder are the topics of the current article.

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Keywords: Herbal tablet, *Tinosporacordifolia*, Immunity

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### **1. INTRODUCTION**

Immunity is defined as the capacity of the body to resist pathogenic agents. The immune system acts to protect the host from infectious agents like bacteria, virus, fungi etc. There are two categories of immunity, or the body's defence mechanism: natural and specific. Before being exposed to pathogens, innate immunity is already present and works to stop infectious organisms from entering the body. Physical barriers, soluble components, and phagocytic cells are all part of it. On the other hand, acquired immunity refers to the body's ability to fight off certain foreign substances like bacteria, viruses, poisons, vaccinations, or transplanted tissues. Immunology is a branch of biomedical science that covers the study of all aspects of the immune response in all other organ-isms. Ayurvedic system of medicine not only deals with treating the diseases but also aims to prevention and fight against the disease. Immunity boosters have become essential these days to keep your body strong. These Immunity boosters are not just needed in changing seasons and fluctuating temperature but are great throughout the year to stay fit healthy. Many people face difficulty in having immunity boosters because of the taste of herbal ingredients. However, you can solve this problem by going for immunity booster tablets that can be chewed or swallowed. To help you go for some good immunity booster tablets that are meant for all age groups. Natural products and herbal medicine have a long track record in treating respiratory infections and many have been approved as drugs or over-the-counter food Additives. Furthermore, people in the community and Researchers are trying to find the best way to cure or Prevent the disease, including using herbal medicine. Since the immune system of plays an essential role during infection, herbal medicine which has an Immunomodulatory effect could have the potential as a Preventive measure and even therapeutic agent for with COVID-19 infection. A recent trend in The community is the consumption of herbal medicines Containing certain compounds, which have Antimicrobial or antiviral, anti-inflammatory and Immune- stimulatory activities such as and Curcumin . Black pepper ,Guduchi , Tulsi Turmeric are Reported effective treatment to check the viral loads. Turmeric has been used Traditionally by many countries in Asia as a drug or Supplement because of its antioxidant, anti-Inflammatory, anti-mutagenic, anti-cancer, and anti-Microbial effects. Many herbal products contain an Active compound, which acts as an antiviral and Immuno- stimulator. Antiviral activities against such viruses have been demonstrated by medicinal plants and their Isolated components. Suppression of viral replication is mainly the mechanism of action .Ayurvedic herbs are used locally and help enhance the immunity of the body and also safe guard by preventing infection since the immune system plays an essential and primary role in the defence against this novel viral infection. Several medicinal plants are used as potential therapeutic agents against various ailments. Indian Ayurveda practitioners suggest a few important plants which supply strong immunity in the body . Some important herbal plants are Turmeric, Tulsi, Black pepper ,Guduchi, Liquorice .

## 2. Materials and Methods

### Materials Method:

Preparation of dry powder of Giloy, black pepper, Tulsi, Turmeric, Liquorice was triturated separately with the help of mortar and pestle. Fine core powder was prepared. Other required ingredients were collected from laboratory in college and triturated along with the other ingredients together. Tablet formulation was done by wet granulation method and further compressed by using hand operating tablet punching machine. The excipients used in the Formulation are Microcrystalline cellulose is used as diluent, Magnesium stearate is used as a Lubricant, Sucrose is used as the filler, Talc is used as a glidant and Gives the pleasant appearance to the tablet, and Acacia, these excipients are used as the binder for the Preparation of wet granulation.

### Formulation of herbal tablets

In this formulation, the dried leaves powder of Tulsi, turmeric, powder of giloy, black pepper and liquorice was used to form a tablet dosage form. The formulation was done by following the wet granulation process and further Compression by in tablet punching machine. Wet granulation method Weigh all ingredients accurately, mix well and triturate by using Mortar and pestle. The prepared 1% binding agent was added Slowly to form a damp mass. Damp mass was transfer through sieve No. 22. Prepared granules are dried at room temperature. The well dried granules are ready for compression.

Table 1: Compression of formulation ingredients of tablet

Drugs	Quantity	Constituents	Uses
Giloy	20 mg	Cordifolia, terpenoids, alkaloids, ligand, steroids.	Improve immunity, Liver disease, Urinary tract infections and heart - related issues
Turmeric	20 mg	Non- volatile curcuminoids and the volatile oil	Disorders of the skin, Upper respiratory tract, joints and digestive system
Tulsi	20 mg	Eugenol, Carvacrol, linalol and $\beta$ -caryophyllene	Reduce cold, cough and other Respiratory Disorder, Reduce stress and blood pressure, Anti-cancer Properties.
Black pepper	20 mg	Alkaloids, Flavonoids, Carotenoids, terpenoids	Good for digestion, prevent constipation, Treats skin problems.
Liquorice	20 mg	Sugars, Starch, Resins, essential oils	Lungs, liver and kidney diseases.

Table 2. : Excipient

Excipient	Quantity	Category
Microcrystalline cellulose	190 mg	Diluent
Magnesium stearate 10 mg	10 mg	Lubricants
Sucrose	80 mg	Filler
Acacia	10 mg	Binder
Talc	1 mg	Glidant
Starch	9 mg	Disintegrates

## EVALUATION

### Pre-formulation study

- **Bulk density**

Bulk density testing was done using a dried 100 ml measuring cylinder. Applying the following formula to dried granules after pouring them into a measuring cylinder;

Bulk density = Mass of the granules/Bulk volume of the granules

- **Tapped density**

Tapped density was carried out by pouring of dried granules in 100 ml megranule Cylinder. 100 tapping was done, note down the volume And calculate by using the following Formula;

Tapped density= Granules weight/Volume of tapped granules

- **Hausner's ratio**

Hausner's ratio is the ratio of the tapped density of granules to the Bulk density of granules. Calculated by using the following formula. Table 3 shows the flow property of granules.

Hausner's ratio= Tapped density/Bulk density

- **Carr's index**

Carr's index or compressibility index is determined by the following Formula. Table 3 shows the flow property of granules.

Carr's index = Tapped density – Bulk density/Tapped density \*100

- **Angle of repose**

Angle of repose was determined by using the funnel methods.

Following formula was used to calculate the angle of repose.



Fig No. 1. Angle of Repose

$$\Theta = \tan^{-1}[h/r]$$

Where,

H = height of granule cone formed.

R = radius of the granule cone formed.

Table:3. Scale of flow ability.

Flow Character	Hausner's ratio	Carr's index	Angle of repose
Excellent	1.00-1.11	≤10	25-30
Good	1.12-1.18	10-15	31-35
Fair	1.19-1.25	16-20	36-40
Passable	1.26-1.34	21-25	41-45
Poor	1.35-1.45	26-31	46-55
Very poor	1.46-1.59	32-37	56-65
Very , very poor	>1.60	>38	>66

### Physical evaluation of tablets

The tablets were subjected to the following evaluation tests.

#### General appearance

The general appearance and color of tablets were found by visual Determination.

Color- Yellowish Brown

Shape- Cylindrical

#### Weight variation test

The weight variation test was performed by following procedure. Weigh 20 tablets individually and consider as X1, X2, X3,.... X20. Determine the average weight of 20 tablets  $X = (X1+X2+X3+...+X20)/20$ . The individual weight was compared with the upper limit and lower Limit. Not more than two of the tablets differs from the average Weight by more than the % error listed, and no tablets differ by More than double that percentage.

Table 4: Weight variation Tolerance

Average weight of tablets(mg)	Max.% difference is allowed
80 or less	10%
80-250	7,5%
More than 250	5%

#### Hardness and thickness test

For each formulation, the hardness and thickness of 20 tablets were Determined. Hardness test was determined by Monsanto hardness Tester and the thickness of tablets was determined by Vernier Calipers. Results are shows in table 7.

#### Friability test

Friability of a tablets can determine in a laboratory by RocheFriabilator. The friabilator consists of plastic chamber that rotates at 25rpm, dropping the tablets through a distance of six inches in the Friabilator, which is then operated for 100 revolutions. The tablets are Reweighed. Compress tablets loss less than 0.5% to 1.0% of the tablet Weight are considered acceptable.

Table 5: Pre-formulation parameters for herbal tablets

Bulk density	0.3 gm/ml
Tapped density	0.434 gm/ml
Hausner's ratio	1.4
Carr's index	30%
Angle of repose	42 degree

Table 6: Weight of tablets

Sr.no.	Weight of tablet (mg)	Sr.no.	Weight of tablet (mg)
1	500	2.	510
3.	504	4.	500
5.	500	6.	510
7.	504	8.	510

9.	500	10.	500
11.	500	12.	510
13.	504	14.	500
15.	510	16.	504
17.	500	18.	500
19.	510	20.	500

Total weight of 20 tablets =10076

Average weight=503.8

5% of 503.8 mg =25.1

Weight variation range is + or – 25.1 mg

Lower limit = Average weight +(Average weight\*% error)  
=503.8-25.1

Lower limit =478.6

Upper limit =Average weight + (Average weight \*% error)  
= 503.8 + 25.1

Upper limit = 528.9

According to IP Average weight of tablets more than 250 allow 5% of variation.

All the individual weight of tablet is within the upper and lower limit.

Sr.no	Thickness of tablet (mm)	Sr.no	Hardness of tablet (Kg/cm
1.	8	1.	2.9
2.	7.5	2.	2.8
3.	7.9	3	3.1
Average	7.8	Average	2.9

#### **Friability test**

20 tablet are weight together

Initial weight = 10076

Final weight (after rotation ) =10000

Friability = Initial weight – Final weight/Initial weight \* 100

Friability = 10076/1000 \*100

Friability = 0.75 %

#### **Disintegration Test :**

This test was a time required for the tablet to separate into particles,the disintegration test measure only the time required under a given set of acondition for a group of tablet to disintegrate into particles .This test was performed to identify the disintegration of tablet in a specific time periods

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## **DISCUSSION**

Herbal immunity booster is a polyherbalAyurvedic formulation which contains herbs that are effective in enhancing immunity-

Tulsi: Modern research has revealed that Tulsi has anti-bacterial, anti-viral and anti-fungal activity that includes activity against many pathogens responsible for human infections .

Giloy: Active compounds 11-hydroxymustakone, N-methyl-2-pyrrolidone, N-formylannonain, cordifolioside A, magnoflorine, tinocordiside and syringin

has been reported to have potential immunomodulatory and cytotoxic effects .

Black pepper: may contain not only anti-inflammatory, anti-oxidant, anti-bacterial and fever reducing actions but immune system enhancing properties

Turmeric: contains a bioactive compound known as curcumin, which acts as an anti-inflammatory agent.

Licorice: has been utilized as a medicinal plant for a variety of human diseases, including infections, neural disorders, peptic ulcers, and asthma

The present report subjects taken herbal immunity booster tablets have shown improvements in enhancing immune functions, physical health.

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