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Development of herbal digestive tablet

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Abstract

Herbal digestive tablet is designed to address digestion problems, which are a Common concern for people of all ages, especially with the rise of fast-food consumption and poor digestion. Despite the wide availability of digestive medications, many of them are enhanced for flavour, obscuring the true purpose behind their use. This study aims to develop, produce, and evaluate herbal digestive tablet to treat indigestion. After a thorough review of India's Ayurvedic formulary, a suitable recipe was selected. The ingredients for this formulation were sourced from trusted suppliers once manufactured; the herbal digestive tablet underwent various pharmaceutical and quality control tests according to World Health Organization (WHO) guidelines. The formulation was also tested for antioxidant properties. The herbal digestive tablet is well-tolerated due to their mild, non-bitter taste. The recipe allows for large-scale production of this digestive tablets.

Keywords: *Celosia Argentea*; Herbal digestive tablet; Antioxidant properties; Indigestion

1. Introduction

Indigestion is a condition that can be caused by incorrect food consumption for certain older populations. Indigestion can be a daily issue, because they contain herbal medications. Herbal digestive tablets are intended to treat indigestion issues because they are readily available and have fewer adverse effects. Herbal medications are popular form of traditional medicine with great demand worldwide. These herbal remedies have been used for centuries in every household following a thorough analysis of the components of the many digestive tablets on the market. A formula for an herbal digestive tablet was created that in addition to its delicious qualities.

The digestion tablet come in the form of round, light brown, smooth-edged tablets that are around 6mm in size and have a nice, spicy taste and smell. The disintegration test, hardness are among the other pharmaceutical assessment criteria that tablets pass. Herbal digestion tablets taste great because they contain less bitter chemicals. The tablet formula can be used to make digestive tablets for large-scale manufacturing.

The Ayurvedic herbal digestive tablets contain *Celosia Argentea* seeds, cumin seeds, black pepper, pippermint, fennel, triphala, black salt, amla, and other excipients. A formula for a herbal digestive tablet was developed after a careful examination of the ingredients in the many digestive tablets available on the market. This tablet may help with digestion in addition to being delicious. In this study, herbal digestion tablets were appropriately formulated using the formula given in Table 1. The pills are further evaluated for several pharmaceutical and pharmacognostic quality control parameters in compliance with WHO guidelines.

1.1. Advantages

- Enhance good health and digestion.

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- Possess anti-oxidant qualities.
- Less adverse effects compared to synthetic medications.

1.2. Disadvantages

- Liver toxicity risk.
- May interfere with other prescription drugs.
- The quality is not standardized.

2. Material and metohd [2-4]

2.1. *Celosia Argentea*

Celosia cristata, another name for *Celosia Argentea*, is a member of the amranthacea family. A plant having numerous traditional therapeutic use. It is used to cure a number of ailments, such as inflammation and diarrhea.

Antioxidant: The plant has antioxidants that help shield the body from oxidative stress and free radicals.

Digestive issue:Constipation, diarrhea, and stomach ulcers are among the digestive disorders that *Celosia Argentea* has been used to treat.

Figure1 *Celosia Argentea* Plants and Seed powder

2.2. Ginger: [11-12]

The rhizomes of the Zingiber Officinalis, a member of the Zingiberaceae family, are used to make ginger. It is thought to have good digestive and carminative qualities. The growing Qualities Are Also Addressed.

2.3. Amla

Amla another name for it is the Indian gooseberry. It is made out of the *embellica officinalis's* fruits. It gives the formulation its antioxidant and nutritional qualities.

Amla is a very good, abundant source of antioxidants and tannins. Enhances Digestion: Amla powder increases the activity of digestive enzymes, which enhances the absorption of nutrients and digestion.

2.4. Jeera

In Indian cooking, jeera powder, sometimes referred to as cumin powder, is frequently utilized. To make it, cumin seeds are ground into a fine powder. Some advantages of jeera powder include the following:

Health of the digestive system: Jeera powder is well known for helping with digestion and for reducing the symptoms of gas, bloating, and constipation. It also promotes digestive health and increases metabolism.

Properties of antioxidants: Jeera powder is abundant in antioxidants that aid in the defense against dangerous free radicals that can destroy cells.

2.5. Pudina

Menthaarvensis, the scientific name for pudina, is a fragrant and therapeutic plant that is a member of the Lamiaceae family. It is well known for its many medicinal uses and is extensively grown in tropical and subtropical areas.

Activity of Antioxidants: Because Menthaarvensis extracts contain flavonoids and phenolic components, studies have shown that they have strong antioxidant activity.

2.6. Black Salt

Black Himalayan salt is another name for it. Kala Namak is a combination of mineral compounds that include a lot of sulfur. This is a very high iron source that helps with gas/acidity, flatulence, and indigestion. Black Fermented Himalayan Salt is used as a laxative and as a digestive aid.

2.7. Fennel

Fennel, or Foeniculum vulgare, is a fragrant and therapeutic herb in the Apiaceae family. It is extensively grown in parts of Asia, particularly India, and the

Mediterranean. Bioactive substances including anethole, fenchone, and estragole, which are abundant in fennel seeds, give them their medicinal qualities, such as digestive and antioxidant advantages.

2.8. Triphala

Emblicaofficinalis (Amla), Terminalia bellirica (Bibhitaki), and Terminalia chebula (Haritaki) are the three medicinal fruits that make up this well-known polyherbal formulation in Ayurveda. Because of its digestive and antioxidant properties, it is frequently utilized. In Ayurveda, triphala is regarded as a Rasayana composition that enhances lifespan and general health.

2.9. Citric Acid

Often present in citrus fruits like lemons, oranges, and limes, citric acid is a naturally occurring organic acid. As a vital Krebs cycle intermediary, this tricarboxylic acid is essential to cellular metabolism.

- Digestive Aid: By promoting the synthesis of digestive enzymes, citric acid can facilitate the breakdown of meals and improve digestion. This can lessen symptoms like indigestion and bloating while also improving the digestive system as a whole.

2.10. Black pepper

Black pepper (nigrum pepper) One of the most sold and utilized spices worldwide is black pepper, which is indigenous to India. For generations, black pepper, commonly referred to as the “King of Spices,” has been prized for its flavor and scent as well as its therapeutic qualities.

- Digestive aid: Piperine can enhance nutrition absorption and activate digestive enzymes.
- Antioxidant: The antioxidant qualities of black pepper powder can aid in preventing inflammation and oxidative damage.

3. Preparation method: [13, 14]

The dry granulation method of tablet manufacturing was used to create the tablets. Granules were made to ensure that the powdery substance flowed properly. Using a tablet punching machine, the granules or powdered medication is compressed to create tablets. Using a lower and upper punch, grains are pressed into a die to create tablets in the tablet punching machine. The process of tablet manufacturing involves the combined pressing action of a die and the punching machine’s lower and higher punches. Subsequently, the pharmacognostic and pharmaceutical assessments were conducted in accordance with the WHO and Indian pharmacopeia, respectively.

Figure 2 Tablets

Table 1 Formulation Table

Ingredients	**F1**	**F2**	**F3**
Celosia Argentea	2 gm	3gm	4gm
Peppermint powder	1.5 gm	2gm	2gm
Ginger powder	0.5 gm	1gm	1gm
Cumin powder	0.5 gm	0.5gm	0.5gm
Amla powder	1gm	1.5 gm	1.5gm
Triphala powder	1 gm	1.5gm	1.5gn
Fennel powder	1gm	1gm	1gm
Black pepper powder	0.25 gm	0.25gm	0.25gm
Black salt	0.1gm	0.1gm	0.1gm
Citric acid	0.25gm	0.25gm	0.25 gm

4. Evaluation test

Test of direct observation: This method allows us to identify the morphological characteristics of the created tablets. The produced tablets color, flavor, taste, size, shape, and true diameter are all visible.

4.1. Disintegration test

In accordance with USP, the disintegration test of digestive tablets was carried out using a disintegration apparatus that had six glass tubes, each of which was three inches long and had a ten-number mesh at the bottom. Six tubes are arranged in a one-liter tank with distilled water that is kept at 37°C±2°C. This mechanism is designed to move up and down at a frequency of 28 to 32 cycles per minute over a distance of 5 to 6 cm. It was discovered that DT was 30 second

4.2. Dissolution test

Evaluates how quickly and efficiently the active herbal constituents are released from the tablet in the gastrointestinal tract.

4.3. Hardness test

Hardness is defined as the force required breaking a Tablet from on its diameter. Hardness is important for testing the strength of the tablets. The hardness test of the tablets evaluation helps us to check the strength of the tablet material, binder etc.

Table 2 Evaluation Table

Test	F1	F2	F3
Physical examination			
Color	Brownish	Brownish	Brownish
Odour	Pleasant	Pleasant	Pleasant
Taste	Spicy	Spicy	Spicy
Disintegration test	30 Second	20 Second	25 Second
Dissolution test	30 Second	20 Second	25 Second
Hardness	1.5kg/cm^2	1.0 kg/cm^2	1.5kg/cm^2

5. Results and discussion

The Herbal digestive tablets were successfully formulated using *Celosia Argentea* along with other herbal ingredients like ginger, amla, cumin, pudina, triphala, black pepper, fennel, black salt, and citric acid. Three formulations (F1, F2, and F3) were prepared with varying amounts of *Celosia Argentea* and peppermint powder, while other ingredients remained consistent.

The results suggest that the herbal digestive tablets formulated with *Celosia Argentea* and other herbal ingredients possess suitable physical and mechanical properties. The disintegration and dissolution times indicate that these tablets can efficiently release active herbal constituents in the gastrointestinal tract, which is essential for their digestive benefits.

The presence of antioxidants from ingredients like amla, pudina, and *Celosia Argentea* enhances the therapeutic value of the tablets by protecting against oxidative stress. The fast disintegration time of F2 makes it the most promising formulation, likely due to its balanced composition, ensuring quick action when ingested. The mild and pleasant taste also improves patient compliance, which is often a challenge with herbal medicines.

The manufacturing process, involving dry granulation and tablet punching, ensured uniformity in tablet size and shape, essential for large-scale production.

6. Conclusion

The study successfully developed a herbal digestive tablet using *Celosia Argentea* with good pharmaceutical properties, including rapid disintegration, adequate hardness, and pleasant organoleptic characteristics. The formulation T2 emerged as the most efficient due to its optimal disintegration and dissolution times, making it suitable for relieving digestive issues. The antioxidant properties further enhance its therapeutic potential. This formulation can be scaled up for mass production, offering a natural and effective remedy for indigestion with minimal side effects compared to synthetic drugs.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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