



## **Formulation and *In vitro* evaluation of Polyherbal Candy based on Indian medicinal plants for the treatment of cough and their stability studies**

**Neeraj B. Lohagaonkar, Sanket R. Vakte, Yash V. Mahajan, Akash M. Pawar, Netradeep B. Rajput, Ramdas T. Dolas, Subodh A. Gangurde, Vaibhav A. Wagh, Pankaj V. Chavan, Vishal S. Gulecha.**

School of Pharmaceutical Sciences, Sandip University, Mahiravani, Trimbakeshwar, Nashik, Maharashtra - 422213.

\*Corresponding Author's E-mail – [sanketvakte832@gmail.com](mailto:sanketvakte832@gmail.com)

### **ABSTRACT**

*This study addresses the development and evaluation of a polyherbal Candy that is not currently on the market. The aim is to provide simple data on the potential health benefits of herbs in the simple dosage Form Mix water and sugar in a deep-bottomed saucepan and bring to a boil. all the herbs was added in the Simple Syrup with constant stirring using a spatula. Then, honey was added, and preservatives were added to the mixture. The contents were immediately poured into candy molds and placed on cooling racks to cool. After cooling down, please store properly at the appropriate temperature. The compounded polyherbal candies were found to have a sweet taste with a distinctive odor due to honey and sugar. No changes in physical appearance such as color, odor and taste were observed, and the pH was found to be 2.4. Polyherbal candies were formulated by adding weighed amounts of the powdered herbs to a simple syrup, then adding honey and adding propylparaben as a preservative. Then the final Candy was evaluated for various parameters.*

*Keywords: Evaluation, Candies, Formulation, Dosage Form, Evaluation.*

Received 11.02.2023

Revised 13.03.2023

Accepted 24.04.2023

### **INTRODUCTION**

Even in areas where modernized medicine is available, interest in herbal drugs and their use has been growing rapidly in recent years. Plant substances and natural medicines are currently attracting great interest in their flexible application, as medicinal plants are the richest source of bioactive substances used in traditional and modern medicines.(1) Herbal plant products are used as the basis of many scientific treatments for humans. herbal products are not only the most effective, but are fantastically non-toxic and have therapeutic doses well below their toxic levels.(2)

Turmeric consists of dried and fresh rhizomes of a plant called *Curcuma longa*. Family- Zingiberaceae. *Curcuma longa* is a rhizome herbaceous perennial plant from the ginger family.(3) It contains 7% essential oils and dietary fiber and 1-6% curcuminoids(4) it is used as an antiseptic, anti-inflammatory, expectorant, spice or condiment. is very rich in antioxidants, studies have revealed the use of turmeric long to treat arthritis, liver disease, Alzheimer's disease and control depression. long turmeric is traditionally used as a medicinal herb in Asian countries for its antioxidant, anti-inflammatory and antimutagenic effects. , antimicrobial and anticancer properties. (5,6)

*Piper nigrum* is a flowering vine of the Piperaceae family, cultivated for its fruit, known as peppercorn, which is commonly dried and used as a spice and condiment. *Piper nigrum* and its active compound piperine have strong antioxidant and anti-inflammatory properties. Laboratory studies suggest that *Piper nigrum* may improve cholesterol levels, blood sugar control, and brain and gut health. (7) The main problem associated with curcumin is its poor bioavailability, Piperine is a known bioavailability enhancer, it is the main active ingredient of *Piper nigrum* and is associated with a 2000% increase in curcumin bioavailability. Therefore, the problem of low bioavailability seems to be solved. by creating a curcumin complex with the addition of active ingredients such as piperine that increase bioavailability.(8)

Ginger (*Zingiber officinale*) is a flowering plant whose rhizome, ginger root or ginger root, is widely used as a spice and folk medicine. (9) It is a herbaceous perennial on which grow annual pseudostems (false stems from rolled leaf bases) about a meter high bearing narrow leaf blades. Inflorescences bear flowers

with pale yellow petals edged in purple and grow directly from the rhizome on separate shoots.(10) In addition, the consumption of ginger rhizome is a typical traditional remedy to relieve common health problems, including pain, nausea, and vomiting (11). Ginger has antioxidant, antimicrobial, and anticancer properties due to the presence of bioactive compounds called 6-shogaol and 6-gingerol.(12)

Hard cough drops are small candies intended to be taken orally and melted slowly to relieve sore throats caused by colds and flu. These treats are made with natural ingredients to help relieve coughs. The medicines in these candies help soothe and lubricate inflamed throat tissue. Many people refer to cough drops as throat drops because of their shape. increase. Most cough drops contain active pharmaceutical ingredients and are not suitable for children to consume. Heavy cough drops are very effective in relieving sore throats and relieving flu and cold symptoms. You need a layer safe product.(13)

Therefore, products such as "hard cough candy" that contain natural ingredients and that can be safely used by people of all ages are in demand. There are several dosage forms on the market and more are needed that work effectively, topically and systematically. Advantages of the current study are increased retention time of the dosage form in the oral cavity and increased bioavailability, which reduces gastric irritation by passing through first-pass metabolism.

#### **MATERIAL AND METHODS:**

Ingredients: Turmeric (500g) and Piper Nigrum (500g) & Ginger were obtained from Nasik at the local market. (IEC code not available) Turmeric, Piper nigrum and Ginger was ground to the desired particle size using a hammer mill.

#### **Preparation of Polyherbal Candy**

Mix water and sugar in a deep-bottomed saucepan and bring to a boil. Stir the mixture with a stirrer. Powdered Turmeric, Ginger, Black Pepper was added with constant stirring using a spatula. Then, honey was added, and preservatives were added to the mixture. The contents were immediately poured into candy molds (sprayed with vegetable oil to prevent the mixture from sticking to the walls of the candy molds) and placed on cooling racks to cool. After cooling down, please store properly at the appropriate temperature. Next, We evaluated the Final candy (Table No.1)

#### **Evaluation studies of Polyherbal candy:**

Physico-chemical parameters:

Curcumin candies were evaluated based on different physicochemical parameters such as color, odor, taste and pH.

a) color examination

The candies were placed on a watch glass and viewed with the naked eye under white light against a white background. The Brown Colour was observed.

b) Odor examination

Five different volunteers smelled the finished candies every 5 times. The time interval between sniffing was kept at 5min to negate the effect of previous fractions and results were recorded individually.

c) Taste examination

A taste examination was performed on 3 volunteers. A final piece of candy was given to each volunteer to examine the taste buds on the tongue.

d) Measurement of pH:

candies were placed in a 100 ml flask containing 100 ml of distilled water and sonicated for about 15 minutes, then the pH was measured using a digital pH meter.

The results of the Physico-chemical parameters are listed in (Table No. 2).

e) Sensory evaluation

Sensory evaluation of various sensory attributes, i.e. Color, appearance, flavor, texture, taste, mouthfeel, and overall acceptability were assessed using the hedonic scale method by rationally trained panelists. 10 is very positive and 1 is very negative. Average scores were calculated for individual sensory attributes. Sensory evaluation is conducted by 20 judges for each quality attributes. (Table No.3)

f) Stability Test:

A physical stability test of the Curcumin Candy was conducted at various temperature conditions such as 2°C, 25°C and 37°C for 4 weeks. Curcumin Candies at different temperatures were found. i.e 2°C, 25°C, and 37°C were physically stable within 4 weeks. The results of the stability study are listed in (Table No. 4).

#### **RESULTS AND DISCUSSION**

The main objective of this study was to develop and evaluate the Polyherbal Candy by adding Turmeric, Ginger and Black Pepper a bioavailability enhancer known to increase the bioavailability of curcumin. ,

was to develop and evaluate a curcumin candy that enhances its bioavailability. Formulated for maximum therapeutic effect. Therefore, problems associated with low bioavailability can be resolved by adding solubility enhancers such as piperine used.

The development of these Candies would be an important advance in the treatment of various ailments previously mentioned with turmeric, Ginger & Black Pepper. This study explores the development and evaluation of Polyherbal candies that are not currently on the market. The compounded Polyherbal candies were found to have a sweet taste with a distinctive odor due to honey and sugar. No changes in physical appearance such as color, odor and taste were observed, and the pH was found to be 2.4. I understand. Therefore, considering all evaluation parameters, it can be said that Polyherbal candy was developed in an appropriate manner.

Table No. 1: Formulation of Polyherbal Candy

Sr. No.	Ingredients	Quantity
1	Turmeric	1.5gm
2	Ginger	3gm
3	Black Pepper	0.5gm
4	Honey	10ml
5	Sugar	66gm
6	Propylparaben	0.02mg
7	Purified Water	50ml

Table No.2: Physico-chemical parameters

Sr. No.	Parameters	Observation
1)	Color	Brown
2)	Odor	Characteristic
3)	Consistency	Hard
4)	Taste	Sweet
5)	pH	2.5

Table No. 3: Sensory Evaluation

Sr. No.	Attribute	Rating Score
1)	Color	7
2)	Odor	8
3)	Appearance	8
4)	Taste	7
5)	Flavor	7
6)	Texture	8
7)	Mouth feel	8
8)	Overall Acceptance	8

Table No. 4: Evaluation of Stability Study

Time (Hr.)	Temperature	Physicochemical parameters			Stability
		Colour	Odour	pH	
1 week	2°C	No change	No change	2.4	Stable
	25°C	No change	No change	2.4	
	37°C	No change	No change	2.5	
2 week	2°C	No change	No change	2.4	Stable
	25°C	No change	No change	2.4	
	37°C	No change	No change	2.4	
3 week	2°C	No change	No change	2.5	Stable
	25°C	No change	No change	2.4	
	37°C	No change	No change	2.6	
4 week	2°C	No change	No change	2.7	Stable
	25°C	No change	No change	2.4	
	37°C	No change	No change	2.4	

Herbal products are used as the basis of numerous scientific treatments for humans. Herbal products are not only the most potent, they are also surprisingly non-toxic, with therapeutic doses well below toxic levels.[14] In recent years, there has been a great deal of interest among researchers and herbalists in the survival of Ayurvedic medical forms. Looking at the global perspective of Ayurvedic formulations, most of the market is covered by herbal medicines for treating various ailments.

The traditional use of turmeric dates back to the Vedic culture of India about 4000 years ago. There, turmeric was used as a spice in cooking and had religious significance.[15] Traditionally, curcumin has always been used as a natural anti-inflammatory moiety. It has been used over the years to treat many conditions.[16] Turmeric has been shown to be beneficial for conditions such as inflammation [17], metabolic syndrome [18], pain symptoms [19], and may also help treat degenerative eye disease and inflammatory disease. [20,21]. It has also shown benefits for the kidneys [22].

Ginger acts as antimicrobial, antioxidant, stable and free from microbial or fungal contamination.(23) In addition, gingerol, shogaol and zingerone have analgesic, anti-inflammatory, antibacterial, antioxidant, hypolipidemic and hypocholesteremic effects. (24)

Polyherbal candies were formulated by adding weighed amounts of the powdered herbs to a simple syrup, then adding honey and adding propylparaben as a preservative. Then the final Candy was evaluated for various parameters.

#### **AUTHOR CONTRIBUTIONS**

All authors contributed equally to the research, writing, and review of this manuscript.

#### **CONFLICT OF INTEREST**

The Authors Declare that there is no conflict of interest.

#### **ACKNOWLEDGMENT**

The authors express their gratitude to the authority of the School of Pharmaceutical Sciences, Sandip University, Nashik, Maharashtra, India for the facilities and encouragement in carrying out research work.

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#### CITATION OF THIS ARTICLE

Neeraj B. Lohagaonkar, Sanket R. Vakte, Yash V. Mahajan, Akash M. Pawar, Netradeep B. Rajput, Ramdas T. Dolas, Subodh A. Gangurde, Vaibhav A. Wagh, Pankaj V. Chavan, Vishal S. Gulecha. Formulation and *In vitro* evaluation of Polyherbal Candy based on Indian medicinal plants for the treatment of cough and their stability studies. *Bull. Env. Pharmacol. Life Sci.* Vol 12[5] April 2023: 155-159.