

“FORMULATION AND EVALUTION OF HERBAL GUMMIES FOR COUGH SUPPRESSANT

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ABSTRACT

These gummies typically contain a blend of plant-based ingredients, such as Tulsi leaves, ginger, Ajwain and Coconut sugar, known for their soothing and anti-inflammatory properties. The formulation aims to alleviate coughing by reducing throat irritation, promoting mucus clearance, and calming the respiratory system.

The convenience and palatability of gummies make them an appealing choice for individuals seeking a more enjoyable way to manage cough symptoms, particularly in children and those who prefer natural remedies. While research on the effectiveness of herbal gummies is still developing, they offer a promising adjunct to traditional cough treatments, with the added benefits of being free from synthetic chemicals and preservatives.

Keywords - Herbal Supplements, Gummy Vitamins, Natural Remedies

INTRODUCTION

Herbal gummier are dietary supplements made from natural plant-based ingredients, typically in the form of chewy, fruit-flavoured candies. They combine the benefits of herbal remedies with the convenience and taste of gummies, making them an appealing option for people looking to incorporate herbs into their daily routine. These gummies can contain a variety of herbs, such as turmeric, , ginger, ajwain, and more, each offering various health benefits like immune support, stress relief, or improved digestion.

Herbal gummies are the more enjoyable way to benefit from the properties of herbs and are commonly used to promote overall well-being, support specific health goals, or complement traditional medical treatments However, it' s essential to use them mindfully, as with any supplement, and consult with a healthcare professional to ensure they are appropriate for individual needs and conditions.

Key Ingredients in Gummy Formulation

Active Ingredients

These are the primary compounds that provide the health benefits of the gummies. In the case of herbal gummies, the active ingredients could include herbs (like Tulsi, ginger or turmeric), vitamins (such as vitamin C, D, or B12), or minerals (such as zinc or magnesium).

1]Agar

A common ingredient used to give gummies their chewy texture. It is most often used in traditional gummy formulation

2]Flavouring Agents

Natural and artificial Flavors are added to gummies to give them appealing tastes, often fruit-based like orange or lemon. Natural fruit juices or concentrates can also be used to provide flavour, with the added benefit of antioxidants.

3]Colouring Agents

Gummies are often brightly coloured to make them visually appealing. Natural colorants like turmeric can be used for colour,

4] Preservatives

To extend shelf life and prevent spoilage, preservatives like citric acid, sodium benzoate, or are often added to gummies. Some brands offer preservative-free versions, relying on natural methods to maintain freshness.

Types of Gummy Formulations

1.Vegan Gummies: These are made without gelatine, often using pectin or agar as a base instead. Vegan gummies can contain herbal extracts, vitamins, and other beneficial ingredients for health and wellness.

2.Sugar-Free gummies: Formulated without added sugar, sugar-free gummies use sugar alcohols or alter

3.Functional Gummies: These are formulated to deliver specific health benefits, such as immune support (e.g., elderberry gummies)

4.Multivitamin Gummies: These gummies contain a combination of vitamins and minerals, such as vitamin C, vitamin D, B vitamins, and zinc, to support overall health and well-being.

5.Beauty Gummies: These are designed for skin, hair, and nail health and often contain biotin, collagen, and other nutrients that support these areas of wellness.

HERBAL DRUG PROFILE

1] TULSI



Hindi Name: Tulsi

Sanskrit Name: Tulsi

English Name: Holy Basil

Latin Name: *Ocimum sanctum* Linn

Indian mythology attaches a great significance to Basil by recognizing it as a holy herb. Perhaps, such significance comes from the actual health applications of the herb. Its use is recommended as a first aid in the treatment of respiratory, digestive and skin diseases. Apart from these common ailments, Ayurveda also recognizes its use for the diseases ranging up to tumorous growths.

Experimental studies identify it to be a highly promising immunomodulator, cytoprotective and anticancer agent. Tulsi or Holy basil is a widely known herb in the family Lamiaceae. It is native to India and vastly cultivated throughout Southeast Asia. Tulsi has a special place in Ayurveda as well as the home of Hindus in India. It is considered sacred by Hindus and worshipped by them.

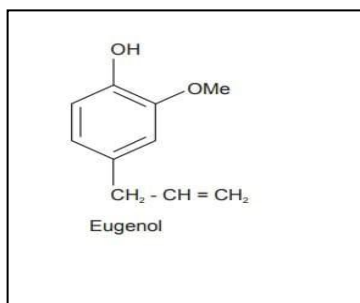
Three main types of Tulsi

1. Bright green leaves called Ram Tulsi
2. Purplish green leaves called Krishna Tulsi
3. Common wild Vana Tulsi.

CHEMICAL COMPOSITION OF TULSI

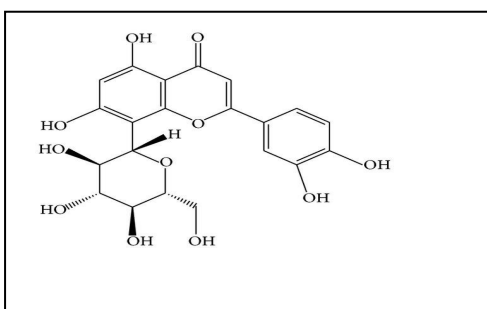
Ocimum sanctum (holy basil) contains various phytochemicals that contribute to its medicinal properties. Here are some of the major phytochemicals found in holy basil:

1] Essential oils:



- Eugenol: the main component of holy basil oil, with antimicrobial, antiinflammatory, and analgesic properties
- Methyl chavicol: another major component of holy basil oil, with antifungal and antibacterial properties
- 1,8-Cineole: a minor component of holy basil oil, with expectorant and bronchodilator properties.

2. Flavonoids:



- Orientin and vicenin: two major flavonoids found in holy basil, with antioxidant and anti-inflammatory properties
- Apigenin: a flavonoid with anti-inflammatory and anti-cancer properties
- Rosmarinic acid: a phenolic compound with antioxidant, anti-inflammatory, and anti-cancer properties

3. Triterpenoids

- Ursolic acid: a triterpenoid with anti-inflammatory, antioxidant, and anti-cancer properties
- Oleanolic acid: a triterpenoid with anti-inflammatory and anti-cancer properties

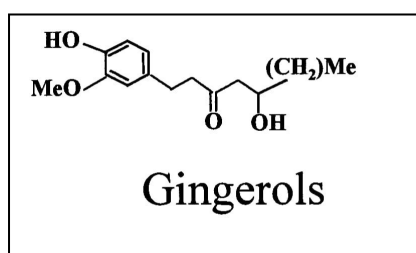
2] GINGER



BOIOLOGICAL CLASSIFICATION

Kingdom	Plantae
Phylum:	Angiosperms
Class	Monocots
Order:	Zingiberales
Family	Zingiberaceae
Genus:	Zingiber
Species	Zingiber officinale

CHEMICAL CONSTITUENTS



Uses:

It is also used as remedies, for painful affections of the stomach, cold, cough, and asthma. Sorethroat, hoarseness, and loss of voice are benefited by chewing a piece of ginger.

3.AJWAIN



Ajwain, also known as carom seeds or omam, is a popular spice in Indian cuisine, known for its distinctive flavor and numerous health benefits. Here's some detailed information about ajwain:

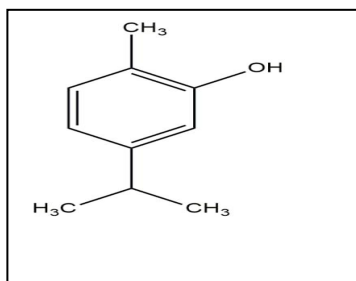
Classification of Ajwain:

Kingdom	Plantae
Division	Magnoliophyta
Class:	Eudicots
Order	Apiales
Family	Apiaceae
Genus:	Trachyspermum
Species	T. ammi (Ajwain or Carom seeds)

Chemical Constituent

1. Thymol:

Major Constituent: Thymol is the primary active compound in ajwain and is responsible for its pungent, aromatic flavor. It belongs to the phenol family and is known for its antibacterial, antifungal, and anti-inflammatory

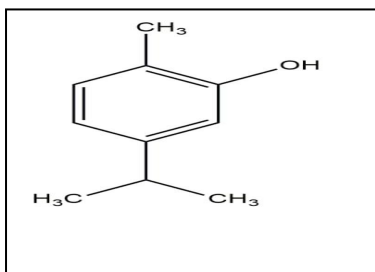


properties.

Health Benefits: Thymol helps in digestion, alleviates respiratory issues, and provides antimicrobial effects

2. Carvacrol:

Presence: Carvacrol is another phenolic compound found in ajwain, though in smaller amounts than thymol.



Properties: It also has antimicrobial and antifungal properties, contributing to the spice's digestive and medicinal benefit

4] COCONUT SUGAR

Coconut sugar is a natural sweetener derived from the sap of the flower buds of the coconut palm tree. It has been gaining popularity as an alternative to regular sugar due to its perceived health benefits.



Uses

It can be used in place of regular sugar in cooking and baking, as well as in beverages like coffee or tea. It's available in granulated form, or as a syrup. Since it's not as sweet as white sugar, some people may need to adjust quantities when substituting it.

5] AGAR

Agar, also known as agar-agar, is a gelatinous substance derived from certain types of red algae, primarily from the genus *Gracilaria* and *Gelidium*. It is widely used in food preparation, microbiology, and as a vegetarian alternative to gelatin. Here's some detailed information about agar:



Source and Production:

Origin: Agar is extracted from seaweed, typically red algae, by boiling the algae in water and then allowing the mixture to cool and solidify. The solidified gel is then dried into strips or powdered form.

Forms: Agar is available in powder, flakes, or bars. It is usually rehydrated in water or other liquids before use.

Uses

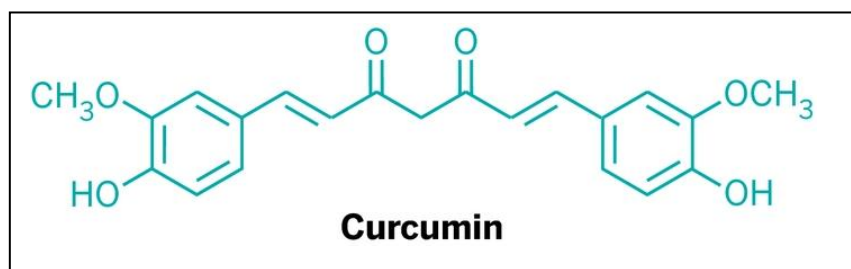
It can be used in place of regular sugar in cooking and baking, as well as in beverages like coffee or tea. Its available in granulated form, or as a syrup.

6] TURMERIC

Turmeric is a vibrant yellow-orange spice commonly used in cooking, especially in South Asian and Middle Eastern cuisines. It comes from the root of the *Curcuma longa* plant, which belongs to the ginger family. Turmeric contains an active compound called curcumin, which has been studied for its potential health benefits, including anti-inflammatory and antioxidant properties.

In addition to its culinary uses, turmeric has been traditionally used in Ayurvedic and Chinese medicine for various purposes, such as improving digestion, boosting the immune system, and promoting skin health. It's often used in powders, teas, or even as an ingredient in topical skincare products.

Chemical structure



Turmeric following classification:

Kingdom	Plantae
Order	Zingiberale
Family	Zingiberaceae
Genus	Curcuma
Species	C. longa

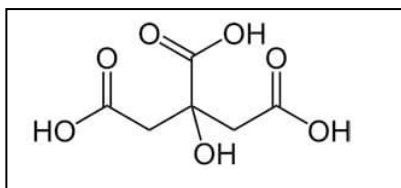
7] LEMON

Lemons are an excellent source of vitamin C and flavonoids, which are antioxidants. Antioxidants help remove free radicals that can damage cells from the body. These nutrients can help prevent diseases and boost health and wellbeing. Here some of the possible benefits of consuming lemons.



CHEMICAL CONSTITUENTS

Citric acid



Botanical Classification of lemon

Kingdom:	plantae
Division:	Angiosperms
Class:	Eudicots
Order:	Sapindales
Family	Rutaceae
Genus:	Citrus
Species:	Citrus limon

8] ORANGE OIL

Orange oil is a type of essential oil extracted from the peel of oranges, primarily *Citrus sinensis*. It has a fresh, sweet, and citrusy scent that is widely used in aromatherapy, cleaning products, and as a natural flavoring. The oil is rich in compounds like limonene, which is known for its antioxidant, anti-inflammatory, and antimicrobial properties.



MATERIAL AND METHOD

Collection and authentication of plants materials that is herbs that are to be involved in the tulsi, ginger, Ajwain and Coconut sugar are Added in required quantity. The mentioned plant leaves were collected from the herbal garden which is located in the premises of HSBPVT GOI Faculty of pharmacy Kashti Ahmednagar Maharashtra. These plants were authenticated by Pansare medicinal plant board Kashti Ahmednagar. This

study was performed to expedite a new formulation and evaluation of a Herbal gummies for the cough suppressent know there effectiveness against the minor throat problems.

1) PREPARATION OF HERBAL GUMMIES

- o Fresh plant leaf is extracted.
- o Then the gummies are formed in to moulds.

2) EVALUATION OF HERBAL GUMMIES:

Physiochemical properties such as

- 1]Weight variation
- 2]Thickness
- 3]Hardness
- 4] PH
- 5]Stickyness
- 6] Apparance

FORMULATION TABLE

Sr.no	INGREDIENTS	F1	F2	F3	PROPERTIES
1	Tulsi	14gm	14gm	14gm	Antitussive,
2	Ginger	7gm	7gm	7gm	Expectorant , Antimicrobial
3	Ajwain	2gm	2gm	2gm	Anti-inflammatory
4	Turmaric	2gm	2gm	2gm	Anti-oxident
5	Coconut suagr	65gm	63gm	61gm	Sweetner
6	Agar	8gm	10gm	12gm	Gelling agent
7	Lemon	1ml	1ml	1ml	Preservatives
8	Orange oil	1ml	1ml	1ml	Flavouring agent
9	Water	100ml	100ml	100ml	solvent

EXTEACTION METHOD BY THE SOXHLET EXTRACTION

1. Preparation of the Sample
2. Set Up the Soxhlet Apparatus
3. Add Solvent
4. Heat the Solvent
5. Condensation and Extraction
6. Refluxing Cycle
7. Completion of Extraction.
8. Solvent Removal

The extracted material is now ready for analysis or further use



Extraction:

The fresh leaves of Tulsi were collected from home garden and washed with water to remove dust. Further leaves Ginger crushed with the help of distilled water by using mortar and pestle. Add the all ingredients in the soxhlet apparatus With 100 ml distilled water for 3-4 hours i.e., Soxhlet method. Thereafter, extract subjected to filtration and evaporated whole water by using water bath so as to get crude extract. Further phytochemical analysis of aqueous extract of Tulsi was carried out by performing identification test.

Method of preparation of Medicated Water bath was set in such a way that water. Then the cool the extract . then the seperate solution prepared the agar they are adding in to the extract and stirring contentious against add the coconut sugar in to the extract then heating 10-15 min add dissolve the sugar they having cooling the extract ,then the cool they having add the lemon and orange oil and cool it the they having transfer the extract in the silicon mould they giving the proper shapes of gummies in to 1-2 hours .

Phytochemical tests

1] Alkloids

Test name	Observations	Inference
1.Mayers test - sample + mayers reagent	Creamy colour ppt	Alkaloid is Present

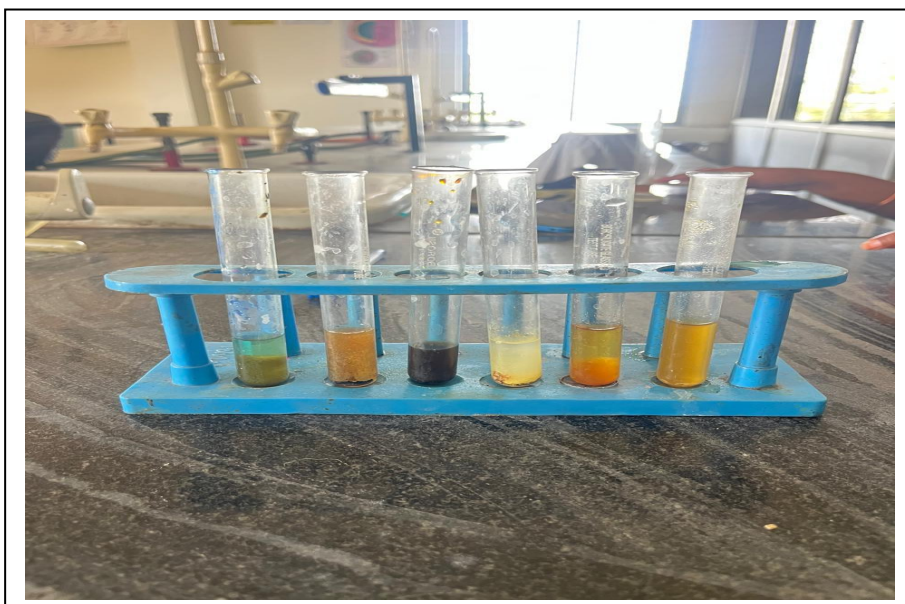
1. Dragendroff test - sample + dragendroff reagents	Orange / raddish brown ppt	Alkloid isAbsent
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2] Flavonoids

Test name	Observation	Inference
1. Sodium hydroxide test Sample +NaOH solution	Yellow colour ppt	Flavoinoid is present
2. lead acetate Sample + lead acetate solutions	Yellow colour ppt	Flavoinoid is present
3. Ferric chloride test Sample + ferric chloride	Green colour ppt / black ppt	Flavoinoid is present

4. Terpenoid

Test name	Observation	Inference
1. Copper acetate test Sample + few drop of copper acetate	Green colour	Terpenoid is present
2. Liebermann burchard test	Colour change	Terpenoid is present



Determination of PH:

we weight 1 gummies and mix in 10ml beaker with diluent water. Then calibrated with PH meter with standard alkali solution, 7PH alkali solution. After we taken the sample measured the PH is 4.6

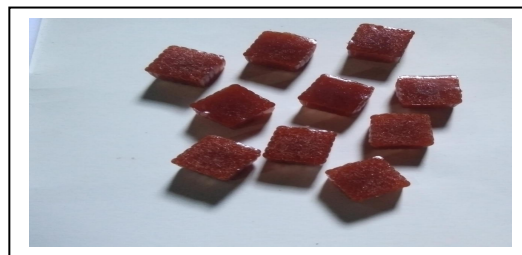
Dissolution test

Herbal gummies typically dissolve within 5 to 25 minutes when placed in an aqueous environment. This is achieved by using a dissolution test to assess how quickly they break down and release their active ingredients. Optimal disintegration time for nutraceutical gummies is less than 15 minutes.

RESULT AND DISSCUSSION

In the present study, formulation and evalution of Herbal gummies having antitussive activity was carried out. Aqueous extract of Tulsi leaves was prepared, and phytochemical analysis was carried out to check the presence of desired compounds that shows the acceptable results. By using prepared extract medicated Gummies prepared and evaluated for general appearance, PH , Texture, colou, odor drug content determination and physical stability.

we concluded that the herbal gummies provide smooth texture to the formulation and are good for masking the slite sweet taste associated with some drugs. Also, good cough suppresent .

**1] solubility test**

Sr no	Solvents	Solubility
1	Water	Sparingly soluble
2	Ethanol	Soluble
3	Ester	Slightly soluble

2] stickiness

Formulation	Stickiness
F1	Gluey
F2	Sticky
F3	Non Sticky

3] Weight variation

Sr.no	Formulation	Average Weight
1	F1	1.8 gm
2	F2	2.02 gm
3	F3	2.07gm

3] Physical appearances

Sr.no	Parameter	Result
1	Color	Raddish yellow
2	odour	Fruity
3	Texture	Soft
4	Clarity	Opaque
5	Consistency	Semisolid
6	Taste	Sweet and spicy

4] Microbial Examination

In the control medium growth of microorganism has observed and in the test medium minimal growth is produced. Which can be concluded by the proof of sterility of the formulation and antimicrobial activity of product.

4] Stability study:

The gummy preparation was found to be stable throughout the 4-week study at room temperature.

SUMMARY AND CONCLUSION

In conclusion, the formulation of medicated gummies for smoking cessation support involved a systematic approach encompassing the extraction of bioactive compounds from selected herbs, preparation of the gel base, incorporation of herbal extracts, and rigorous quality control testing. The use of soxhlet extraction ensured efficient extraction of key.

The future benefit or advantage of herbal oral gummies is that the plants used in our formulation are easily available and are also already being used from ancient times and traditional medicines. The polyherbal oral gummy formulated using herbal extracts is safer than using synthetic one, since it increases patient compliance.



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