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Review Article

A Polyherbal Formulation of Tea Infusion Bag by Using Indian Insulin and Oyster Mushroom for The Treatment of Diabetes and Cholesterol Management

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ABSTRACT

This study is to examine the phytochemicals, nutritional value, and antioxidant, antidiabetic, and antihyperlipidemic properties of Indian insulin plant and Oyster mushroom in combination with Green Tea, Ginger, and Cinnamon. These herbs are abundant in polyphenols and antioxidants. In order to determine the best way to combine these medicinal herbs to make a useful beverage, the research focuses on making and evaluating a herbal tea infusion bag. The Oyster mushroom, or Pleurotus ostreatus, is a common edible mushroom that is grown all over the world for its distinct flavor, scent, and taste. They are a great source of fiber, vitamins, minerals, and biological proteins. Furthermore, the inclusion of bioactive components such phenol, flavonoids, terpenes, and polysaccharides—which have been shown to have anti- microbial, anti-cancer, anti-hyperlipidemia, anti-diabetic, anti-inflammatory, and immunostimulant properties—is driving up their demand. They serve as a possible source for the creation of functional or value-added food items because of their positive health impacts. The review aims to highlight the exceptional nutritional qualities and their noteworthy connection to health-promoting qualities, which consider Oyster mushrooms to be a superfood and plant-based nutraceuticals. The Insulin plant, or Costus igneus, is a Southeast Asian medical herb that was just brought to India, where it is currently planted as a decorative plant. The plant's leaves are used as a dietary supplement to treat diabetes because they contain a variety of phytochemicals, such as steroids, alkaloids, flavonoids, and saponins. In addition to its well-known tagline, "a leaf a day keeps diabetes away," it has a variety of pharmacological qualities, including neuroprotective, antibacterial, anti-inflammatory, antioxidant, and antidiabetic actions. The pharmacological properties of the plant and its potential for use in upcoming therapeutic formulations are examined in this review.

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INTRODUCTION

Herbal tea, or tisane, has gained popularity due to its biological properties and potential as a complement to modern medicine. Rooted in ancient practices like Ayurveda and Traditional Chinese Medicine (TCM), herbal remedies often combine multiple herbs for enhanced pharmacological effects. With 60-90% of the global population using plant-based medicine, herbal teas are a common, non-caffeinated beverage enjoyed for their health benefits, including boosting immunity, relieving stress, and promoting overall well-being. Herbal teas, consumed widely across cultures, are recognized for their therapeutic properties and serve as a natural alternative to conventional medicine.[1]

The Agaricaceae family of microscopic fungi includes mushrooms, which come in a range of shapes and sizes. They are a source of nutritional and therapeutic substances and grow on decomposing organic materials. Only about 35 species—including Pleurotus and Agaricus— are commercially grown, despite the fact that almost 2,000 species are edible. With 85% of the world's edible mushroom production, China leads the field, followed by the USA, Canada, Japan, and India. In 2018 and 2019, 43 million tons of mushrooms were produced worldwide; by 2025, it is anticipated that this amount will surpass 50 million tons. Production in India has been growing in areas including the northeastern hills, Western Ghats, and the Himalayas.[9] In India, the production of mushrooms differs by region: the North-West is dominated by button mushrooms, the South by milky mushrooms, Odisha by paddy straw mushrooms, and the North-East, Chhattisgarh, and Bihar by Oyster Mushrooms. Third in output after Agaricus and Lentinula, Oyster mushrooms (Pleurotus species) are among the most widely consumed edible mushrooms worldwide. All of the essential amino acids as well as non-essential ones like glutamic acid and arginine are present in these foods, which are also high in dietary fiber, proteins, carbs, vitamins, and minerals. Because of its high magnesium and zinc content, certain varieties, including P. djamor, P. pulmonarius, and P. citrinopileatus, are especially renowned for their functional health advantages. Oyster mushrooms are becoming more and more popular, particularly among heart patients and those with lifestyle disorders, due to its nutritional and therapeutic qualities, which include being a low-calorie, high-protein diet. They are valuable to the food business because of their perishable nature, which necessitates creative preservation techniques, and because they have the potential to improve the health of processed foods.[9] The lignocellulosic fungus known as Oyster mushrooms (Pleurotus spp.) belong to the Agaricaceae family and are prized for their bioactive substances, which include phenolic compounds, proteins, terpenes, and unsaturated fatty acids. These bioactive compounds are utilized in the creation of new drugs and have been thoroughly investigated for their medicinal potential.[9] Oyster mushrooms (P. ostreatus) are promising functional foods for regulating oxidative stress and hyperlipidemia because of their strong anti-hyperlipidemic properties, which include reducing LDL cholesterol and triglycerides while raising HDL levels. According to studies, the extract from the mushroom lowers triglyceride and cholesterol levels in rats. It can also help lower blood pressure and prevent problems linked to obesity.[5] Oyster mushrooms also have anti-diabetic qualities; research has shown that they can improve Insulin resistance and lower blood glucose levels. These results raise the possibility of using oyster mushrooms in nutraceuticals as a natural treatment for diabetes and lipid- related disorders.[5] The Costaceae family includes the Insulin plant, Costus Igneus, which is becoming more and more well-liked in

India due to its ability to help control blood sugar levels. Herbal treatments for diabetes, such as the Insulin plant, are becoming more popular due to the negative effects of oral hypoglycemic medications. Originally from Southeast Asia, mainly Indonesia, it is now commonly grown as an ornamental plant in India, particularly in Kerala. Chewing the leaves for a month is said to help regulate blood glucose levels in traditional Ayurvedic medicine, and it is becoming more and more well-known worldwide as a herb for diabetes treatment.[6] The Insulin plant, or Costus Igneus N.E. Br., is a tropical evergreen perennial belonging to the Costaceae family. Simple, alternating, oblong leaves (4–8 inches long) with purple undersides and parallel veining are spirally grouped around stems. The plant can reach a height of 60 cm, and its stems frequently topple over. During the warm months, it bears lovely orange blooms that are 2.5–12.5 cm in diameter and appear at the terminals of branches in cone-like clusters. Common names for the plant include Fiery Costus, Spiral Flag, and Insulin Plant, and it is cultivated using stem cuttings.[6] Numerous substances, including steroids, triterpenoids, alkaloids, tannins, flavonoids, glycosides, saponins, carbohydrates, and proteins, were found in Costus igneus during phytochemical screening. The largest quantity of phytochemicals, including phenols, alkaloids, flavonoids, and terpenoids, was found in the methanol extract. The leaves are high in protein, iron, and antioxidants such as ascorbic acid, α-tocopherol, β-carotene, terpenoids, steroids, and flavonoids, according to additional analysis.[7] The Insulin plant's leaves are used to treat diabetes in the Ayurvedic system. For the first week, patients are instructed to chew two leaves every day (morning and evening), making sure to thoroughly chew the leaves before swallowing. The dosage is lowered after a week to one leaf taken twice daily for 30 days. Both allopathic and Ayurvedic physicians advise this diet since it is thought to be successful in regulating blood sugar levels. As the slogan goes, "a leaf a day keeps diabetes away."[8] Commonly found in South Indian gardens, Costus Igneus is well-known for its potent anti- diabetic properties, especially through its leaves, which help reduce blood glucose levels during fasting and after meals. The plant also lowers glycosylated hemoglobin, improves lipid profiles, boosts body weight and insulin levels, manages renal and hepatic parameters, decreases diabetes complications, and exhibits improvements in histopathological testing, however the precise mechanism of action is still unknown. [8]

Review Of Literature: -

1. Pritha Chowdhury &Santanu Paul et al. 2020. studied “The Potential Role of Mushrooms in The Prevention and Treatment of Diabetes**”** Diabetes mellitus is characterized by elevated blood glucose levels due to inadequate insulin production. While synthetic hypoglycemic drugs are common, they often have side effects. Researchers are exploring mushrooms as a natural source of bioactive substances with anti-diabetic properties. Key compounds include polysaccharides, proteins, dietary fibers, and other active metabolites. Studies in both in vitro and in vivo models show promising results. Among the 39 mushroom species identified with anti-diabetic potential, Pleurotus, Grifola, and Agaricus are the most studied. Clinical trials are limited, but medicinal mushrooms show future promise in diabetes treatment.
2. Krishan Kumar et al 2020. studied the "Netraceutical Potential and Processing Aspects of Oyster Mushroom (Pleurotus Species)" Oyster mushrooms, particularly Pleurotus ostreatus, are gaining popularity for their health benefits and nutritional value. Rich

in proteins, dietary fiber, β-glucan, vitamins, and minerals, they also contain higher levels of certain amino acids compared to other mushrooms. Known for their hepatoprotective, antioxidant, anti-bacterial, anti-diabetic, and anti-carcinogenic properties, oyster mushrooms offer potential in combating malnutrition. They can be especially beneficial in regions with limited access to animal protein, providing a sustainable source of nutrition. Overall, P. ostreatus shows promise as a functional food to address dietary deficiencies.

3. H. M. Manukumar, J. Shiva Kumar, B. Chandrashekhar, Shri Raghava and S. Umesha et al. 2017. " Evidences for diabetes and insulin mimetic activity of medicinal plants: Present status and future Prospects. " Hyperglycemia is the primary symptom of diabetes mellitus, a serious metabolic disease linked to cardiovascular and metabolic complications. By 2030, an estimated 439 million adults will have diabetes, with type- 2 diabetes (T2DM) being the most common. This review discusses the causes and management of diabetes, focusing on T2DM's insulin resistance and autoimmune attacks on β-cells in type-1 diabetes (T1DM). It highlights the growing popularity of herbal remedies, which are cost-effective and have fewer side effects compared to conventional treatments. The review also emphasizes plant-based insulin-mimetic molecules and suggests future research opportunities in diabetes control through plant sources of antidiabetic compounds.
4. Mendel Friedman et al. 2016. Studied the " Mushroom polysaccharides : chemistry and antiobesity, antidiabetes, anticancer, and antibiotic properties in cells, rodents, and humans." There are about 2,000 species of edible and therapeutic mushrooms, many of which contain bioactive compounds like polysaccharides, particularly β-glucans. These compounds offer various health benefits, such as antioxidative, anti-inflammatory, immunomodulatory, anticancer, antibacterial, antiviral, antidiabetic, and antiobesity effects. While research, including epidemiological and clinical studies, has explored their potential in managing chronic diseases like infections, cancer, diabetes, and obesity, further studies are needed to fully understand the mechanisms and optimize their use for disease prevention and treatment.
5. Prakash K. Hegde, Harini A Rao, Prasanna N Rao et al. 2014 . "A Review on Insulin plant (costus igneus Nak)" Costus igneus (Spiral flag) and Costus pictus, native to South and Central America and now grown in India, are perennial plants valued for their aesthetic appeal and medicinal properties. Their leaves are used as a food supplement to treat diabetes, especially in southern India. In addition to diabetes prevention, these plants possess various pharmacological benefits, including hypolipidemic, diuretic, antioxidant, antibacterial, and anticancer effects. Phytochemical studies have identified several bioactive compounds, such as carbohydrates, triterpenoids, proteins, alkaloids, tannins, saponins, flavonoids, steroids, and trace elements. This review aims to explore and summarize the phytochemical and pharmacological research on these plants.
6. DK Patel, SK Prasad, R Kumar, S Hemalatha et al. 2012. " An overview on antidiabetic medicinal plants having insulin mimetic property. " Diabetes mellitus affects about 2.8% of the global population, a number expected to rise to 5.4% by 2025. Herbal remedies have long been recognized for their therapeutic benefits and are increasingly integrated into modern medicine. This review examines 65 plant species with hypoglycemic

properties, categorizing them by their active phytoconstituents and plant parts used. It also highlights promising bioactive compounds, such as beta- pyrazol-1-ylalanine and epigallocatechin gallate, which show potent insulin-mimetic and antidiabetic effects, often surpassing traditional medications. The plants' antidiabetic properties, including blood glucose-lowering effects, are primarily attributed to polyphenols, flavonoids, terpenoids, and coumarins. The research emphasizes the potential of these plants and their active ingredients in treating diabetes mellitus.

Rationale Of the Study: -

Need Of Work: -

This study to explore the potential of this herbal tea as a natural, safe, and effective remedy for diabetes and cholesterol management. The rationale for this study is to create a herbal tea infusion bag using Oyster mushroom, Indian Insulin plant, Green tea, Cinnamon, and Ginger for the management of diabetes and cholesterol. The key justifications for this approach include:

1. Synergistic Effect:

Each ingredient has individual therapeutic properties Oyster mushroom and Indian insulin plant are known for their antidiabetic effects, while Cinnamon and Ginger are beneficial for cholesterol management. Green tea provides antioxidant and metabolic support. Combining these herbs could provide a more comprehensive, synergistic approach to managing both diabetes and cholesterol.

2. Safety and Natural Treatment:

Herbal remedies are often considered safer with fewer side effects than pharmaceutical treatments, making them a more sustainable option for long-term use

3. Effectiveness:

The herbs selected have been studied for their potential in lowering blood glucose, reducing cholesterol levels, and improving overall metabolic health, offering a holistic approach to managing these common health issues.

4. Affordability and Accessibility:

Herbal teas are cost-effective and more accessible than many conventional medications, making them a viable option for a broad population, particularly in regions with limited access to modern healthcare.

5. Multifaceted Benefits:

Each herb offers a range of health benefits, such as antioxidant properties, anti-inflammatory effects, and improvement in metabolic health.

Plan Of Work: -

1. Selection of pure drug
2. Preparation of material and Methods
3. Selection of effective method of preparation
4. Experimental design
5. Formulation and preparation of Herbal Tea Infusion Bag
6. Result & discussion
7. Conclusion
8. Reference

Drug Profile: -

Ingredients:

Oyster mushroom



Fig No 1.1 Oyster Mushroom

Synonym: - Pearl oyster mushroom, Hiratake, Pleurotus ostreatus.

Biological source:- Pileus or cap is shell-like, spatulate and the stipe of Pleurotus ostreatus spp.

Description

Colour: - White, Grey, Yellow, Brown, Cream

Odour:- Slightly fishy or seafood, and sometimes compared to anise Taste:-Subtle seafood flavor with hints of anise and a faint, Earthy taste.

Chief Chemical Constituents: -

Vitamins, Crude fiber, Potassium, Steroids, Beta glucan, Lectin Bioactive compounds: Such as phenol, flavonoids, terpene, and terpenoid, which have health benefits such as antioxidant, antimicrobial, and hepatoprotective activities.

Uses: -

1. Used to treat the diabetes and hyperchlorestol
2. Enhances Immunity.
3. Prevent osteoporosis and arthritis.
4. Boost vitamin D levels.

Indian Insulin



Fig no. 1.2 Indian Insulin

Synonym: - Costeus Igneus, Step ladder, Spiral flag, Fiery costus, and painted spiral ginger.

Biological source: - leaves of plant Chamaecostus cuspidatus

Description

Colour: - Green leaves with a slight reddish tint on the edges.

Odour: - The insulin plant flower don't have any aroma, The leaves of insulin plant are to have an acrid.

Taste: - Raw leaves give a bitter taste

Chief Chemical Constituents: - Alkaloids, Glycosides, Tannins, Phenols, Steroids, Terpenoids and Flavonoids, Ascorbic acid, A-tocopherol, β-carotene, B-glucan.

Uses

1. Used in the treatment and management of diabetes mellitus type-1 and sometimes diabetes mellitus type-2
2. Antioxidant.
3. Anticancer
4. Anti-inflammatory

Green Tea



Fig No 1.3 Green Tea

Synonym: - Matcha, Oolong, Rooibos, Genmaicha, Sencha, Chawan, Azuki, Camelia sinesis

Biological source: - The leaves of the Camellia sinensis plant.

Description

Colour:-Dried green tea leaves are typically thin, curly, And dark green.

Odour:-Green tea has a mild, Slightly grassy.

Taste :-Astringent flavor with a characteristic sweet or floral aroma.

Chief Chemical Constituents: - Caffeine, Tannins: Gallotannic acid,Catechins: A type of polyphenol found in white, green, and yellow teas,Theobromine and theophylline: Found in minor quantities, Volatile oils: Give tea its agreeable odor **,**Protein, wax, resin, and ash: Also found in tea leaves

Uses

1. Stimulating
2. 2.Improving heart health
3.Regulating body temperature and blood sugar
4. Improving mental processes

Ginger



Fig no 1.4 Ginger

Synonym: - Jiang, Adrak, Jengibre, Zenzero, Gingembre, Zanjabeel, and Ingwer

Biological source: - The rhizome or underground stem of plant Zingiber officinale.

Description

Colour: - Fresh ginger root: The outside of fresh ginger root is usually light brown, while the inside is pale yellow.

Odour: - Warm, Spicy, and Aromatic Odour with a hint of sweetness.

Taste: - Spicy, Peppery, warm, And slightly sweet.

Chief Chemical Constituents: - Phenolic compounds, Terpenes Other compounds like Carbohydrates, Lipids, Amino acids, Raw fiber, Ash, Protein, Phytosterols, Vitamins, and Minerals.

Uses

1. Dietary supplement
2. Aromatherapy

3. Disease prevention
4. Boost metabolism

Cinnamon



Fig no 1.5 Cinnamon

Synonym:- Canel and Canella,

Biological source:- Cinnamon is the inner bark of the Cinnamomum tree

Description

Colour:- A medium-Brown with a Red-Orange tinge.

Odour:- Warm, Spicy, And Slightly fruity aroma with notes of Vanilla and Pepper

Taste:- A sweet and woody Flavour, cinnamon has a slight Citrusy note, and its Spicy taste is often likened to the powerful punch of cloves.

Chief Chemical Constituents: - Cinnamaldehyde, Eugenol, Camphor, Trans-cinnamyl acetate, Caryophyllene, Terpene hydrocarbons

Uses

1. Flavouring
2. Cosmetics
3. Medicine

MATERIALS AND METHODS: -

Collection of Materials

1. Oyster Mushroom powder

The required oyster mushroom powder was collected from Mahogany Organics and authenticated by following techniques.

Authetification Test:

A] Physical Analysis: -

Visual Examination: colour and texture Partical size: by sieving

B] Chromatographic Techniques :-

Thin Layer Chromatography

➢ MATERIALS:

1. Mushroom powder sample
2. TLC plates (silica gel or aluminum-backed)
3. Solvent system (e.g., ethyl acetate: methanol: water, 8:2:1)
4. Standard reference compounds (e.g., ergosterol)
5. TLC tank
6. UV lamp (254 nm and 366 nm)
7. Spray reagents (e.g, Dragendorff's reagent)

➢ Preparation:

Extract the mushroom powder with a suitable solvent (e.g., methanol, ethanol) to create a 10- 20 mg/mL solution. Filter the extract using a 0.45 μm membrane filter.

➢ TLC Procedure:

1. The TLC plate was activated by heating at 105°C for 30 minutes.

2. About 5-10 µL of the mushroom extract and standard reference compounds were applied to the TLC plate, 1 cm from the bottom.
3. The TLC plate was placed in the TLC tank, ensuring the solvent level is below the sample spots.
4. The plate in the solvent system was developed for 30-60 minutes or until the solvent front reaches 8-10 cm.
5. The plate was removed and dried.
6. The plate was visualized under UV light (254 nm and 366 nm) and fluorescent compounds were detected.
7. The plate was sprayed with a suitable reagent to detect specific compounds.

Detection and Interpretation:

The Rf values (retardation factor) of the mushroom extract to standard reference compound were compared. The compounds were identified based on color, intensity, and Rf values.

Spray Reagents:

Dragendorff's reagent: detects alkaloids.



Fig No. 2.1 Oyster Mushroom Powder

2. Indian Insulin

The leaves of Indian insulin plant was collected and powder was prepared by using the following procedure.

1. Plant material were collected.
2. The collected plant material was clean and wash with water.
3. The plant material dried immediately to prevent spoilage.
4. Shade-drying: Spread out in a single layer on a clean surface.
5. The dried plant material was grind into smaller pieces.
6. Pass through sieve no. 120
7. And Indian insulin plant powder was obtained.

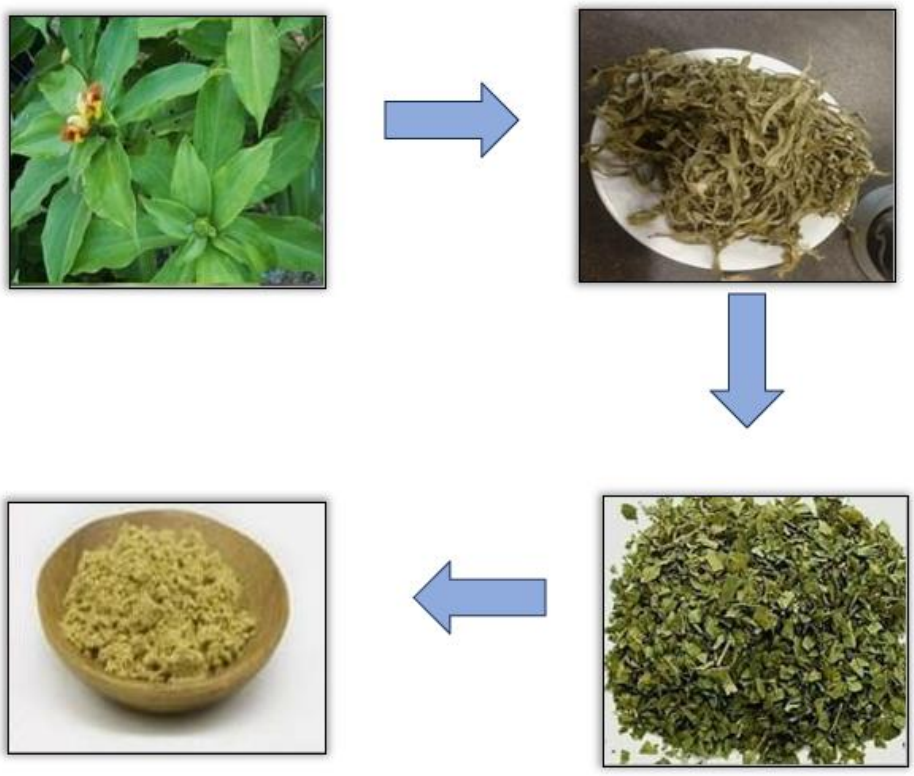


Fig No. 2.2 Process to Obtain Indian Insulin Plant Powder

3. Green Tea

The required Green tea leaves were collected and powder was prepared using following procedure.

1. Green tea leaves were collected.
2. The leaves were dried and grinded them into fine powder.
3. And pass through the sieve. (sieve no. 120)
4. And Green tea powder was obtained.



Fig no. 2.3 Green tea powder

4. Ginger

The roots of Ginger were collected and powder was prepared by using the following procedure.

1. The roots of Ginger were collected.
2. The collected roots were clean and wash with water.
3. The roots dried immediately to prevent spoilage.
4. Shade-drying: Spread out in a single layer on a clean surface.
5. The dried roots was grind into smaller pieces.
6. The obtained powder was pass from the sieve.(sieve no. 120)
7. And Ginger powder was obtained.



Fig no. 2.4 Ginger powder

5. Cinnamon

The sticks of cinnamon was collected and powder was prepared by using the following procedure.

1. The sticks of cinnamon were collected.
2. Broken down into small pieces.
3. Using mortar and pestle , grinded them into fine powder.
4. Pass through sieve no. 120
5. And cinnamon powder was obtained.



Fig no. 2.5 Cinnamon Powder

Preparation Of Herbal Tea Infusion Bag

The five dried and milled herbs were mixed in varying proportions to obtain formulations, 1.75 gram samples of each formulation were bagged in rectangular infusion tea bags. (one tea bag contains 1 to 3 grams of tea thus 1.75 gram is sufficient to consider.)

Formulation no. 1

Table no. 1 Formulation no. 1

Sr. No.	Ingredients	Quantity (%)	Quantity (gm)
1	Oyster Mushroom	20	0.35
2	Indian Insulin	15	0.26
3	Green Tea	30	0.52
4	Ginger	20	0.35
5	Cinnamon	15	0.26

Formulation no. 2

Table no. 2 Formulation no. 2

Sr. No.	Ingredients	Quantity (%)	Quantity (gm)
1	Oyster Mushroom	20	0.35
2	Indian Insulin	20	0.35
3	Green Tea	30	0.52
4	Ginger	15	0.26
5	Cinnamon	15	0.26

Formulation no. 3

Table no. 3 Formulation no. 3

Sr. No.	Ingredients	Quantity (%)	Quantity (gm)
1	Oyster Mushroom	20	0.35
2	Indian Insulin	30	0.52
3	Green Tea	20	0.35
4	Ginger	15	0.26
5	Cinnamon	15	0.26

Evaluation

Organoleptic test:

Organoleptic test was performed by visual inspection for appearance, colour, odor and taste.

Table No. 4 Organoleptic Test

Ingredients	Colour	Odor	Taste
Oyster mushroom	Brown	Anise	Earthy taste
Indian insulin	Green	Acrid	Bitter
Green tea	Green	Slightly grassy	Astringent
Ginger	Light brown	Aromatic	Spicy
Cinnamon	Dark brown	Aromatic	Sweet

Physical test:

Loss on drying: Loss on drying is the loss of weight expressed as % w/w resulting from water and volatile matter can be driven off under specified conditions. Weigh about 2 gm of the air-dried crude drug in a dried and tarred flat weighing dish. Dry in oven at 100-105°C. Cool in desiccators over phosphorus pentoxide for specific period of time. The loss in weight is recorded as moisture. Repeat the process till constant weight is obtained.

Qualitative estimation: The decoction of herbal tea was subjected to phytochemical screening for identification of different phytoconstituents like carbohydrates, proteins, alkaloids, tannins, glycosides, and flavonoids.

RESULT AND DISCUSSION: -

Authentication Test Results:

The RF value of the spots observed on the TLC plate were Spot 1 : RF = 0.45

Spot 2 : RF = 0.60

Presence of alkaloid :

After spraying Dragendorff's reagent, several orange or reddish-brown spots were observed, indicating the presence of alkaloid compounds in the oyster mushroom powder. And confirms the authenticity of the mushroom powder as Pleurotus ostreatus. The present work of herbal tea was subjected to organoleptic test, physical test, and qualitative estimation.

Organoleptic test: It includes

Table No. 5 Organoleptic Test

Evaluations	F1	F2	F3
Colour	Green	Green	Green
Odor	Pungent	Pungent	Pungent
Taste	Sour	Sweet	Sour
Overall acceptability	Low acceptability	High acceptability	Medium acceptability

Physical test: It includes

Table no. 6 Physical test

Test	F1	F2	F3
Loss on drying	4	3	3.5

Qualitative Estimation: It includes

Table No. 7 Qualitative Estimation

Chemical test	F1	F2	F3
Carbohydrates	+	+	+
Proteins	+	+	+
Alkaloids	-	-	-
Tannins	+	+	+
Glycosides	+	+	+
Flavonoids	+	+	+

In the above table

(+) indicates presence of phytoconstituents (-) indicates absence of phytoconstituents

DISCUSSION: Based on the above results, it can be said that the formulation-2(F2) is highly acceptable due to its better taste than the other two formulations.

CONCLUSION:

From the above effects it might concluded that new formulation of Herbal tea infusion bag can be use and effective. This formulation showcases the potential of natural medicine in addressing chronic health challenges, paving the way for new, sustainable solutions. The formulation holds promise for improving the lives of millions affected by diabetes and cholesterol, assuring in a new era of natural, effective therapies. Further research will focus on optimizing the formulation and exploring its potential application in other health condition.

Future Scope:

The effectiveness of the herbal tea for diabetes or cholesterol management can be studied and bioassays could be conducted in vitro (testing the teas ability to inhibit alpha-glucosidase or reduce the cholesterol, in laboratory setting) or in vivo (animal models).

REFERENCES

1. A Raja Reddy, Nelikanti Vaishnavi, Suman Yadav, Yaski Saitej, Formulation and Evaluation of Herbal Tea. International Journal of Creative Research Thoughts Volume 12 ISSN 2320-2882.
2. Beta-glucans in the treatment of diabetes and associated cardiovascular risks, (7), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2663451/
3. K. Khatun, H. Mahtab, P.A. Khanam, M.A. Sayeed, K.A. KhanOyster mushroom reduced blood glucose and cholesterol in diabetic subjectsMymensingh Med J, 16 (2007), pp. 94-99
4. S.E. Kahn, R.L. Hull, K.M. UtzschneiderMechanisms linking obesity to insulin resistance and type 2 diabetesNature, 444 (2006), pp. 840-846
5. Peicheng Zhao, Meizhu Guan, Wei Tang, Noman Walayat, Yuting Ding, Jianhua Liu.Structural Diversity, fermentation production, bioavtivities and application of triterpenoids from several comman medicinal fungi:Recent advances and future perspectives. Volume 166, Ap[ril 2023, 1054470.Science Direct.
6. Prakash K Hegde, Harini A Rao, Prasanna N Rao. A review on Insulin plant 9Coctus igneus Nak) 2014 Jan-Jun; 8 (15) : 67-72. National Library of Medicine.
7. John reddy Peasari, Sneha sri Motamarry, Karthikeya Srinivasa Varma, P. Anitha, Rvindra Babu Potti.Volume 13, 2018 Pages 34-40.Science Direct.
8. Christine Fallabel.Costus Igneus : Side Effects of the Insulin Plant foe Diabetes Treatment. December 2, 2022. Healthline.
9. Phuritshabham vivekanandini Devi, Jasmine Islam Pameena Narzary, Daisy Sharma, Farhanaz Sultana. Bioactive compounds, nutraceutical values and its application in food product development of oyster mushroom. Volume 4, Issue 4, December 2024, Pages 335-342. Science Direct.
10. GeorgeA, Thankamma A, Rema Devi VK, Fernandez A. Phytochemical investigation of Insulin plant (Costus pictus) Asian J Chem. 2007;19:3427–30. [Google Scholar]
11. Jayasri MA, Gunasekaran S, Radha A, Mathew TL. Anti-diabetic effect of Costus pictus leaves in normal and streptozotocin-induced diabetic rats. Int J Diabetes and Metabolism. 2008;16:117–22. [Google Scholar]
12. Dhanabal SP, Kumar A, Chandrasekar R, John S, Joseph S, James M, Hypoglycemic and antioxidant activities of Costus mexicans

(Costaceae) Aryavaidyan. 2007;21:53–8. [Google Scholar]
13. Bhat V, Asuti N, Kamat A, Sikarwar MS, Patil MB. Antidiabetic activity of insulin plant (Costus igneus) leaf extract in diabetic rats. J Pharm Res. 2010;3:608–11. [Google Scholar]
14. Mani P, Kumar AR, Bastin TM, Jenifer S, Arumugam M. Comparative evaluation of alloxan diabetic rats. Int J Pharm Tech. 2010;2:183–95. [Google Scholar]
15. Ashwini S. Pundkar, Prachi M. Murkute, Bhagyashree Dhotre, A Review: analytical method development and validation for estimation of Ivabradine HCL by RPHPLC, World Journal of Pharmacy and Pharmaceutical Sciences, 2021 Vol. 11 – Issue 1, Page No. 190-194 ISSN 2278-4357
16. Prachi Murkute, Snehal Wani, Ashwini Pundkar, Protective effect of curcumin alone and in combinatiob with Isradepine against chemical induced seizures and oxidative stress in mice. International journal of Pharma02 Volume 2, Issue 2/Mar-April 2020, ISSN: 2582-4708.

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