

# Formulation of Jelly Containing Paneer Dodi

A Research Project

Submitted in partial fulfillment of the requirements of the degree of  
(Bachelor of Pharmacy)

By

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## **CERTIFICATE**

This is to certify that project work embodied in this report entitled "**Formulation of jelly containing Paneer dodi**" Carried out by **Vedanti Bhoir, Riya Bhoir, Chanchal Bhoir, Sneha Bhoir, Saloni Bhoir, Saurabh Borde**, studying at Shri. Pandit Baburao Chaughule College Of Pharmacy for partial fulfillment of Bachelor of Pharmacy Degree to be awarded by University of Mumbai. This project work has been carried out under my guidance and supervision and it is up to my satisfaction.

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## COMPLIANCE CERTIFICATE

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## DECLARATION

As required by the university regulation No. 2445, I wish to state that the work embodied in this thesis titled, FORMULATION OF JELLY CONTAINING PANEERDODI FOR TREATMENT OF DIABETES forms my own contribution to the researchwork carried out under the guidance of assistant Prof. Sidra Choudhary at the Shri Pandit Baburao Chaugule College of Pharmacy, Bhiwandi. This work has not been submitted for any other degree or any other university. Whenever references have been made to previous work of others, it has been clearly indicated as such and included in the bibliography.

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**Dedicated To  
My Parents,  
Friends  
And  
My Family**

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**LIST OF ABBREVIATION**

<b>Sr. No.</b>	<b>Abbreviation</b>	<b>Full Form</b>
1	NaOH	Sodium hydroxide
2	Hcl	Hydrochloric acid
3	UV	Ultra Violet
4	W.Cogulant	Withania coagulant
5	pH	Negative logarithm of hydrogen ionconcentration
6	°C	Degree Celsius
7	ML	Mililiter
8	cps	One-hundredth of a poise
9	µg	Microgram
10	Mg	Miligram
11	gm	Gram
12	nm	nanometre
13	q .s.	Quantity Sufficient
14	Ca <sup>2+</sup>	Calcium

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## ABSTRACT

As we all know that traditional herbs and plants have any medicinal benefits and used in treatment of wide variety of diseases. Paneer Doda is traditional plant which is used in treatment of many diseases such as diabetes, wound healing menstrual disorders, etc. Paneer phool (*Withania Coagulans*) have medicinal properties to control diabetes mellitus type 2. Paneer dodi is available in powder form (rarely) but most commonly available as dried phool which is soaked overnight in a water to have maximum benefits to control diabetes. But it has only drawn that it is bitter in taste. So oral medicated sweet jelly formulation has a sweet taste and has an attractive appearance. So, it has become easy to have a medicine by altering its bitter taste and can be given to paediatrics as well as geriatric patients suffering from diabetes mellitus.

Paneer Doda (*Withania Coagulans* Dunal), belonging to the family Solanaceae, is a small bush which is widely spread in South Asia. It grows as short shrub (35-75 cm) with central stem. This shrub is common in Afghanistan, East India & Nepal. In India it occurs in Punjab, Rajasthan, Simla, Kumaun and Garhwal. It is commonly known as 'Indian cheese maker' or 'vegetable rennet' due to coagulant property of leaves and fruits. The berries contain two esterases, free amino acids, fatty oil, an essential oil and alkaloids. The amino acids present are proline, hydroxyproline, valine, tyrosine, aspartic acid, glycine, asparagin, cysteine and glutamic acid.

A variety of withanolides have been found in the plant which are responsible for its therapeutic properties. It is widely used in treating diabetes mellitus, nervous exhaustion, disability, insomnia, wasting diseases and failure to thrive in children. The fruits of the plant are reported to be sedative, emetic, alterative and diuretic. They are also helpful in liver complaints, asthma and biliousness.

*Withania coagulans* is commonly known as Paneer Dodi belonging to family Solanaceae is a well-known plant in herbal medicinal systems having great potential against diabetic disease by improving the secretion of insulin. It was thought worthwhile to explore its application into our body to treat type-2 diabetes, it acts on the insulin receptors for the better consumption of insulin.

## CHAPTER ONE INTRODUCTION

Paneer Dodi is used in treatment of diabetes type 2. Dodi means milk coagulans formed by plant so known as paneer dodi. Diabetes mellitus is group of metabolic disorders in which a person has high bloodsugar either because body does not produce enough insulin or because cells do not respond to insulin that is produced.

- **Diabetes Type 1:** when pancreas unable to produce enough insulin.
- **Diabetes Type 2:** when body does not respond to insulin.
- **Synonyms:** Paneer Dodi, Vegetable Rennet, Indian Cheese Maker.
- **Biological Source:** Dried fruits of Withania Somnifera Dunal.
- **Family:** Solanaceae
- **Chemical Constituent:** The main constituent is withanolides, Carbohydrates, Aminoacid, Fatty oil, Essential oil.
- **Uses:** Anti- diabetic, Wound healing, Menstrual disorders, Kidney stones, bloodpurifier.



Fig 1: Paneer Dodi Plant



Fig 2: Dried Fruits of Paneer Dodi

Chronic non-communicable diseases are currently the main cause of both disability and death worldwide. This heterogeneous group of diseases including cardiovascular conditions, cancers, chronic respiratory conditions and diabetes affect people of all ages and social classes. It is predicted that globally, deaths from non-communicable diseases (NCD) will increase by 77% between 1990 and 2020 and that most of these deaths will occur in the developing regions of the world. These conditions not only cause enormous human suffering, they threaten the economies of many countries as they impact on the older and experienced members of the workforce. The plants are the key source for treatment and prevention of diseases and maintenance of healthy life. The use of medicinal herbs and herbal medicine is an age old tradition and the recent progress in modern therapeutics has stimulated the use of natural product worldwide for diverse ailments and diseases. One of these plants which are used to treat various diseases is *Withania Coagulans* Dunal). The plant is known by different names in different languages, such as 'Akri' or 'Puni-ke-bij' in Hindi, 'Tukhme – Kaknaje hindi' in Persian, Spicebajja in Afghan, Khamjira in Punjabi and Punir band or 'Punir – ja – fota' in Sindhi. The shrub is important for the property of coagulating milk, possessed by its berries; they are used for this purpose in North-West India and adjoining country. The milk-coagulating activity is due to the presence of an enzyme, which can easily be isolated by extracting the berries with water and precipitating the enzyme either by ammonium sulphate or by adding two volumes of acetone. The precipitate is dried at low temperature and the enzyme is obtained as a brownish white powder.

## CHAPTER TWO LITERATURE REVIEW

The relentless rise in the prevalence of diabetes Mellitus has spurred an urgent need for innovative and effective therapeutic interventions. Amidst this quest, traditional systems of medicine, particularly Ayurveda, offer promising avenues for exploration. Paneer Dodi, a botanical fruit from *Withania coagulans*, has garnered attention for its anti-diabetic properties. Recent advancements in pharmaceutical formulation have led to the development of medicated jelly containing Paneer Dodi, offering a convenient and palatable mode of administration. However, the efficacy, safety, and potential mechanisms of action of this formulation remain to be comprehensively elucidated. This literature review seeks to synthesize and evaluate the existing body of evidence surrounding the use of various formulations containing Paneer Dodi in the management of diabetes mellitus, providing insights into its therapeutic potential and future research directions.

### A. Formulation and Evaluation of Herbal Capsule Containing Paneer Dodi and Fenugreek for The Treatment of Diabetes

The formulation and evaluation of herbal capsules containing Paneer Dodi (*Withania coagulans*) and Fenugreek (*Trigonella foenum-graecum*) for the treatment of diabetes represent a significant area of interest in contemporary research. Diabetes mellitus is a chronic metabolic disorder characterized by elevated blood glucose levels, often associated with various complications affecting multiple organ systems. Traditional herbal remedies have garnered attention for their potential therapeutic benefits in managing diabetes, offering a natural and often safer alternative to conventional medications. Paneer Dodi and Fenugreek are two herbal ingredients known for their anti-diabetic properties, with documented mechanisms of action including enhanced insulin secretion, improved glucose uptake, and modulation of key enzymes involved in glucose metabolism. This literature review aims to provide a comprehensive overview of existing research on the formulation and evaluation of herbal capsules containing Paneer Dodi and Fenugreek, focusing on their pharmacological properties, potential synergistic effects, and clinical efficacy in diabetes management. Through critical analysis of the available literature, this review intends to contribute to the understanding of herbal interventions in diabetes treatment and pave the way for further exploration of natural remedies in combating this prevalent metabolic disorder.

#### ➤ Formulation of Capsule: -

- Ingredients used:- Paneer Dodi 25 gm
- Fenugreek 25 gm
- Method of Preparation: Collection ◊ Drying ◊ Triturate ◊ Sieving ◊ Mixing of Powder ◊ Capsule filling ◊ Packaging and Storage
- Direction for Use: Maximum 1 gm of dose is required per day to treat diabetes. In size 1 capsule 300mg is filled (So, dosage frequency is thrice capsule per day)



Fig 3: Raw Drug



Fig 4: Packaging

*B. Paneer Dodi: A Magic Remedy for Diabetes Mellitus.*

Paneer dodi, has been traditionally used in Ayurvedic medicine for its potential health benefits, including its purported effects on diabetes mellitus. Several studies have explored its efficacy in managing diabetes, with promising results.

One study published in the Journal of Ethnopharmacology found that Paneer dodi extract significantly reduced blood glucose levels in diabetic rats. Another study in the Indian Journal of Experimental Biology reported similar findings, suggesting that Paneer dodi possesses hypoglycaemic properties.

➤ *Extraction Method:*



Fig 5: Paneer Dodi Fruit Extract

About 8-10 seeds of Paneer Dodi were soaked in a glass of water overnight. The solution is filtered and the extract is consumed in the next morning empty stomach. Blood sugar level should be checked regularly and dose is adjusted.

However, while these preliminary studies are promising, more extensive clinical trials are needed to fully understand the efficacy and safety of Paneer dodi as a remedy for diabetes mellitus. Additionally, its mechanisms of action and potential side effects require further investigation.



### **CHAPTER THREE**

#### **AIM AND OBJECTIVES**

- Aim and goal of our drug (Withania Coagulans) is that to make drug sweet or to alter the bitter taste of drug.
- Only to mask the taste but also aim that to not be use any type of sugar or harmful products.
- We also aimed on dose reduction as it is traditional plant and used by many years to treat variety of disease.
- As it is used as dried fruit which is soaked in water for overnight and next day in morning it is consumed.
- So, to reduce this dose powder extract is used.
- For paediatrics patient formulate in the form of jelly which has attractive appearance.





➤ *Objective:*

- As compare to consume by overnight soaking method. Jelly formulation reduce the dose.
- The drug has bitter taste. So, taste masking is done.
- The drug has bitter taste so; it is necessary to mask Odor.
- By formulating in the form of jelly, will altering the appearance.

## CHAPTER FOUR METHODOLOGY

➤ *Materials*

Table 1: List of Ingredients

Ingredients	Quantity (for one jelly)	Images
1.Paneer dodiPowder	0.5gm	
2.Jaggery	5gm	
3.Agar-agar	0.2gm	
4.Distilled Water	q.s.	

➤ *Method of Preparation:*

All the required ingredients for the formulation should weighed accurately. Dry paneerdodi powder drug was dispersed in distilled water and the solution is kept on heat on 2min. Afterwards the solution is filtered and the drug extract is obtained. Then the required amount of Agar-Agar was added to the solution as a gelling agent with continuous stirring. The jaggery was slightly boiled to melt and then slowly added to the paneer dodi drug and agar-agar mixture with continuous stirring. Finally, the mixture is kept on heating until thick gel like consistency is appropriate mould with an airtight seal. Further it is allowed to cool at room temperature to form jelly.



Fig 6: Paneer Dodi Jelly

## CHAPTER FIVE RESULT AND DISCUSSION

### A. Evaluation Test

#### ➤ Solubility Test

Pre-formulation solubility analysis was done, which includes the selection of suitable solvent system to dissolve the drug as well as excipients such as NaOH, HCl, Water, Ethanol, Chloroform.

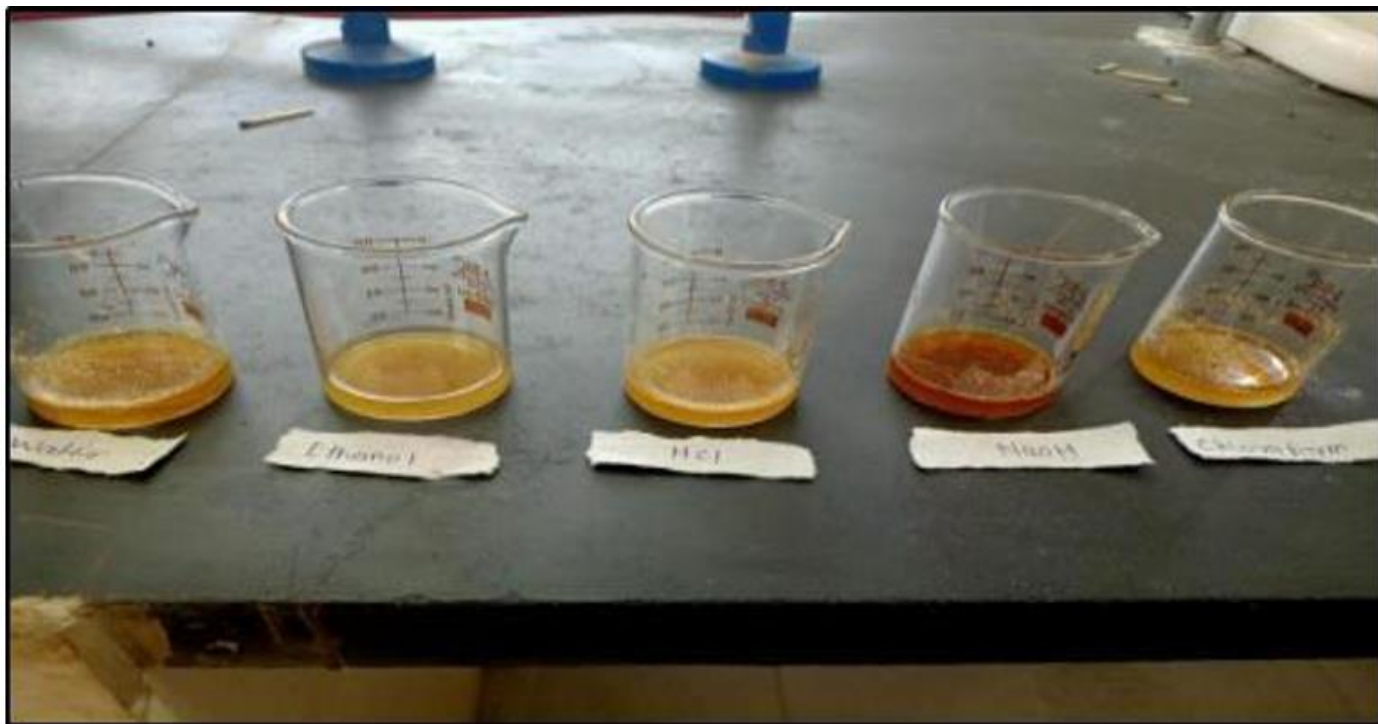


Fig 7: Solubility in Different Solvent

#### ➤ pH Test

The pH of jelly was measured by using a digital pH meter at room temperature 25 C. For this purpose, 0.5g of jelly was dispersed in 50ml of distilled water to make 1 percent of solution and the reading was noted.



Fig 8: Digital pH Meter

➤ *Organoleptic Properties*

Colour	Brown
Odor	Sweet Odor
Taste	Sweet to slight bitter

➤ *UV-Visible Spectrophotometric Method*

The U.V. spectrum was recorded in range 200-550 nm using buffer as a blank. The absorbance maxima for the drug were determined at 227nm.

Table 2: Concentration Vs Absorbance

Concentration (ppm)	Absorbance
0.1	0.421
0.2	0.54
0.3	0.675
0.4	0.741
0.5	1.005

• *Calibration Curve:*

✓ *Procedure:*

To perform UV, stock solution is prepared of 1mg of drug powder add 10 ml of distilled water to form 100ppm solution. From above prepared stock solution pipette out 0.05ml and make up to form 0.5ppm. Again, pipette out 0.04ml and make up to form 0.4ppm solution. Again, pipette out 0.03ml make up to form 0.3ppm. Again, pipette out 0.02ml and make up to form 0.2ppm. Again, pipette out 0.01ml and make up to form 0.1ppm.

To plot graph on X-axis, plot concentration(ppm) and on Y-axis, plot Absorbance. Equation:  $y=mx+c$ .

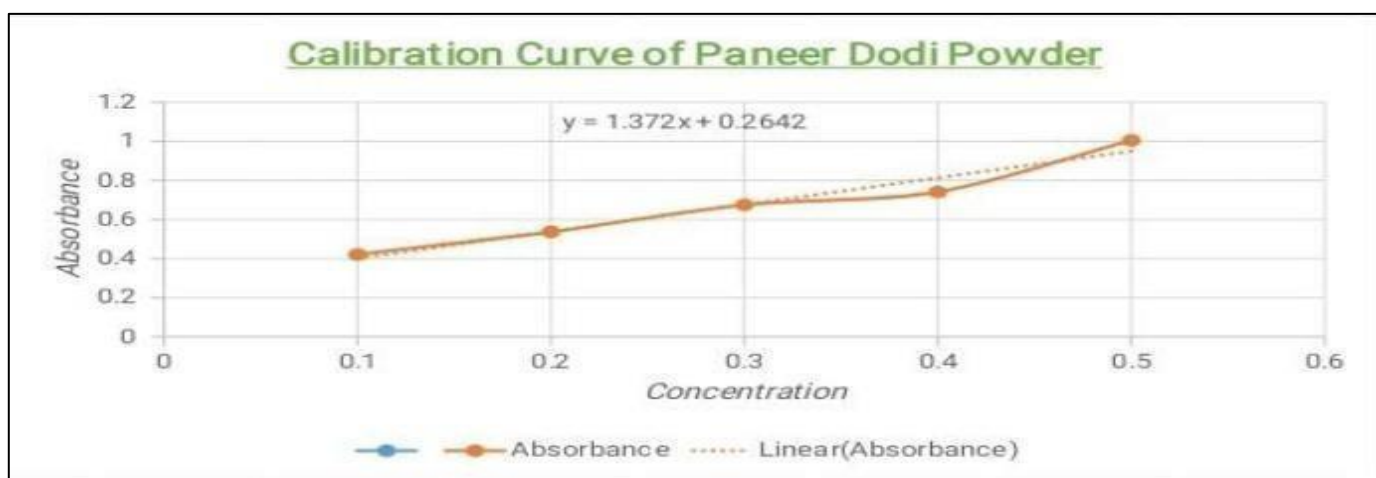


Fig 9: Calibration Curve

➤ *Weight Variation*

To determine weight variation, the weight of three jellies were measured. The average weight of jellies calculated.

➤ *Stability studies*

The jelly formulation was packed in aluminium foil sand in polythene containers at 0° C, 25° C/ 60 RH for 15 days.

➤ *Viscosity Studies*

Viscosity was determined by Brookfield Viscometer. The sample is taken in suitable beaker and spindle no.4 used and is fixed after dipped in sample to the mark of spindle. Precaution is taken that spindle should not touch the corners of beaker and it should be middle of the solution.

➤ *IR Spectrum of Medicated Jelly*

The identify of the drug by comparing IR Spectrum of the drug with reported spectrum of Withania Coagulans.

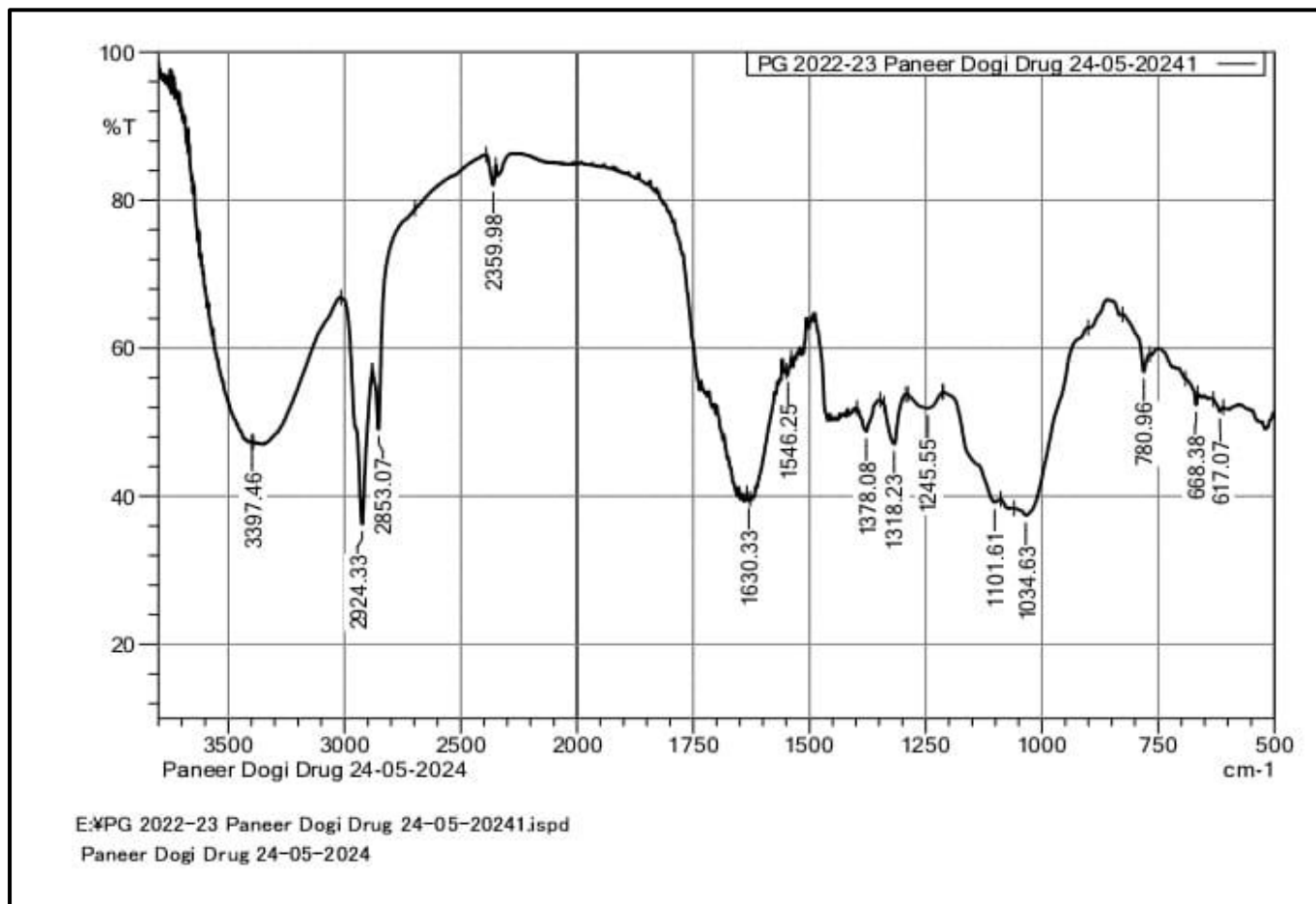


Fig 10: IR Spectrum of Medicated Jelly

Table 3: Interpretation of FTIR spectra of Panner Dodi

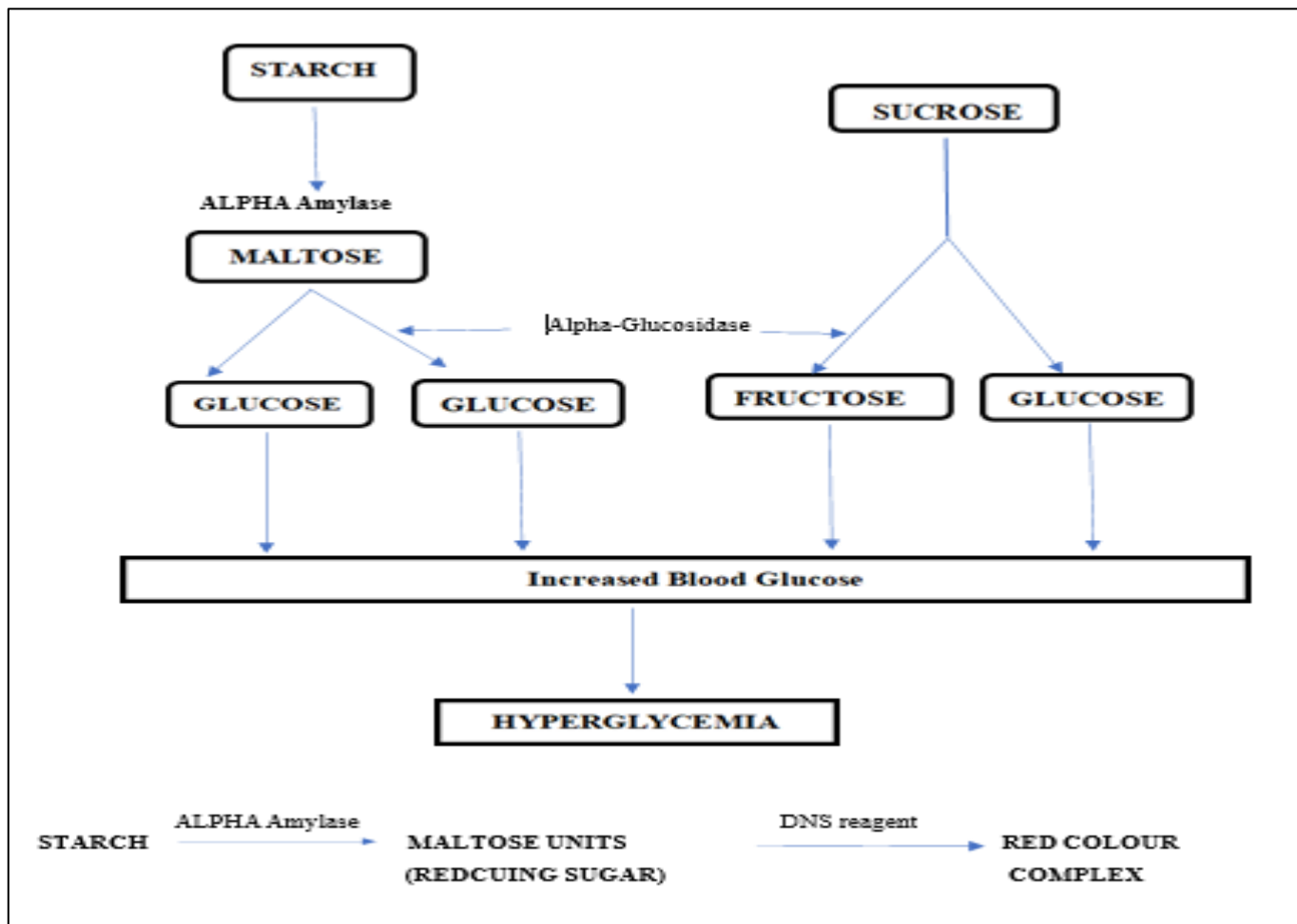
Reported wave number(cm-1)	Observed wave number(cm-1)	Functional groups
600-1000	617	C-H Alkene (Stretch)
600-1000	668	H-C≡C-H Alkyne (Stretch)
650-1350	780	R-CH <sub>2</sub> -OH Alcohol (Stretch)
1740	1034	R-CHO Aldehyde (Stretch)
1715	1630	R-C=O-R Ketone (Stretch)
1700	1378	O-H Carboxylic acid (Stretch)
1740	1318	C-O Ester (Stretch)
1125-1110	1101	R-O-R' Ether (Stretch)
3400-3300	3397	R-NH <sub>2</sub> Amine (Stretch)
1600-1700	1245	R(C=O)-NH <sub>2</sub> Amide (Stretch)
1580	1546	M-X Halide (Stretch)
3550-3230	2924	C <sub>6</sub> H <sub>5</sub> OH Phenol (Stretch)
2500-2700	2853	R-SH Thiol (Stretch)
2200	2359	RC≡N Nitrile (Stretch)

➤ Syneresis

Jelly experience syneresis or de-swelling due to the release of liquid, resulting in shrinkage of jelly and reduced. Syneresis was more pronounced in the jelly, where lower concentration of gelling agent was employed. It was observed after 24 h of jelly preparation. None of the developed jelly formulations showed syneresis at room temperature (25°C) and 8°C. The syneresis was not noticed at room temperature may be due to binding of free water by co-solute

➤ *To Determine Anti-Diabetic Potential of Plants*

• *Diabetes Principle:*



Alpha- amylase activity can be measured in-vitro by hydrolysis of starch in presence of alpha-amylase enzyme.

This process can be quantified using DNSA reagent, which gives red colour on reaction with reducing sugar maltose (hydrolysed product of starch).

The intensity of red colour indicates the enzyme induced hydrolysis of starch into maltose. If the extract possesses alpha-amylase inhibitory activity, the intensity of red colour will be less.

In other words, the intensity of red colour is inversely proportional to alpha-amylase inhibitory activity. Absorbance in presence and absence was noted.

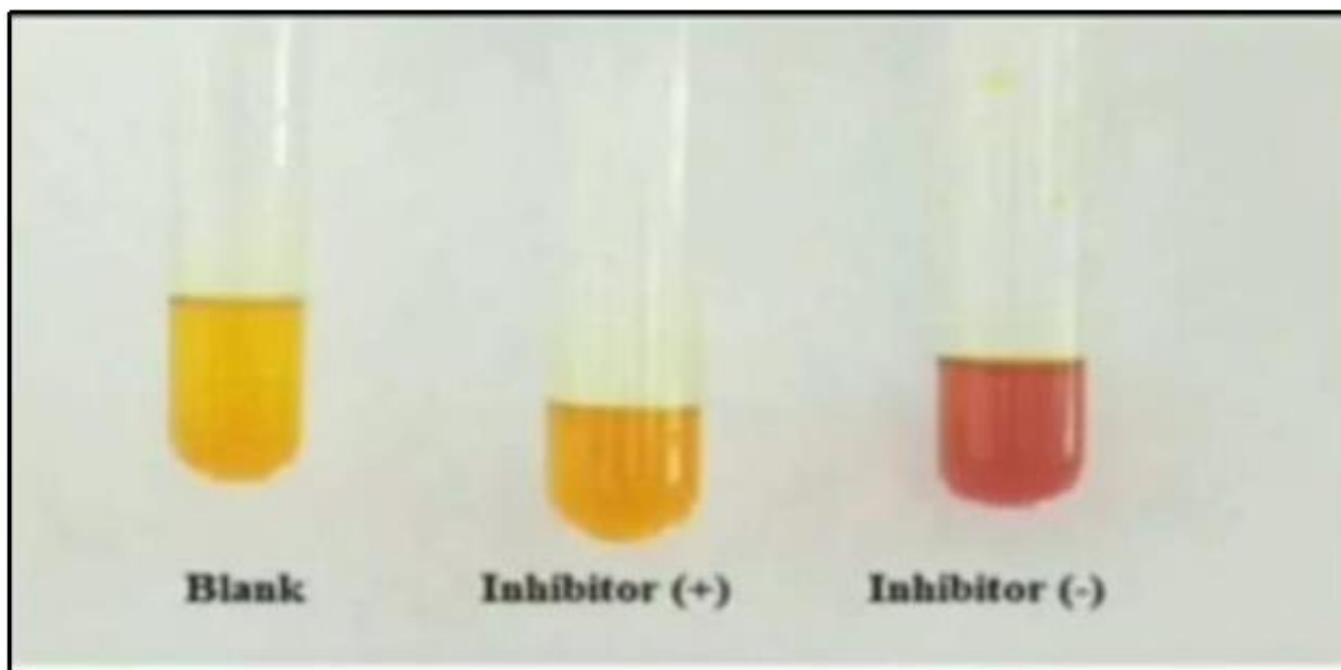


Fig 11: Reaction in Presence and Absence of Inhibitor

➤ *Result*

Table 4: Evaluation Parameter

Test	Result
1. Solubility	Highest solubility in ethanol
2. pH	5 to 6
3. Colour	Brown
4. Odor	Sweet
5. Taste	Sweet to may slight bitter
6. UV Visible Spectrophotometric	At Lambda max. 227nm, maximum absorbance is observed.
7. Weight Variation	9.85gm
8. Stability studies	Clear, smooth, soft texture with No Crystallization and slightly stickiness isobserved.
9. Viscosity Study	Viscosity range found to be 53305 to61731cps.
10. IR Spectrum of Medicated Jelly	IR spectra of panner dodi
11. Syneresis	Jelly does not show syneresis at roomtemperature.
12. Anti-diabetic potential of plant	It possesses alpha-amylaseinhibitoryactivity.

➤ *Discussion*

The outcomes of this research have provided insight into anti-diabetic effect of *Withania coagulans*, a small bushy shrub and belongs to the family Solanaceae.

In an effort to combine the alternative system of medicine using plant extracts with thatof the pharmaceutical jellies, the aqueous extract from the berries (dried fruit powder) of *W. Coagulans* has been mixed with agar (gelling agent) and jaggery (taste masking agent), with two converging aims: one is to provide reduced dose and the other is to mask the bitter taste.

Since most of the plant extracts that exert an anti-diabetic effect act by promoting insulin secretion from beta cells, it was first hypothesized that *W. Coagulans* promotesinsulin secretion by sensitizing or stimulating the beta cells through activation of  $Ca^{2+}$  channels and, in turn, exocytosis of insulin from insulin containing granules.



## **CHAPTER SIX CONCLUSION**

Oral synthetic or chemical based anti-hypoglycemic agents are useful in the treatment of diabetes mellitus but their use is restricted by the pharmacokinetic properties, secondary failure rates and accompanying side effects.

Plant drugs are considered to be lesser toxic with lower side effects than synthetic drugs.

Withania Coagulans (Panner Dodi) is three medicinal plants having the treasure of natural medicines which will be used in the treatment of diabetes mellitus.

In the present study, pediatric oral soft jellies loaded with Withania Coagulans were successfully formulated using agar-agar as gelling agent.

The optimized formulation showed acceptable Organoleptic properties and standard curve for panner dodi.

For further validation of above findings, it is necessary to perform the in vivo study anti-diabetic activity.

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