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FORMULATION AND EVALUATION OF ELIXIR OF GYMNEMA SYLVESTRE BY USING LEAF EXTRACT

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Abstract:

In the present research work, the main objective is to formulate and evaluate Elixir of Gymnema Sylvestre by using Leaf extract. There are lots of chemical agents available to control and to treat diabetic patients, but total recovery from diabetes has not been reported up to this date. Alternative to these synthetic agents, many herbal plants with hypoglycemic properties are known from across the world. Gymnema Sylvestre is an herb native to the tropical forests of southern and central India and Sri Lanka. The medicinal part of the plant is the leaf, which reduces or eliminates the ability to sweetness tastes. Gymnema sylvestre leaves are known for several medicinal uses such as antidiabetic, hypolipidemic, stomachic, diuretic, refrigerant, astringent and tonic, the major bioactive constituents of gymnema sylvestre are a group of triterpenoid glycosides known as gymnemic acids with gymnemagenin as common aglycone. Which is responsible for its tremendous activity specially its blood glucose lowering capacity. In this studies we have shown that the extract of gymnema sylvestre is useful in controlling blood sugar to treat type II diabetes (NIDDM) when gymnema leaf extract is administered to a diabetic patient it stimulate the pancreas to increase release of insulin.

The elixirs were prepared by using Sodium Saccharin, Glycerin and Alcohol etc. The elixirs were evaluated for FTIR, Viscosity, PH, Refractive Index, Alcohol Content and Assay. In this preparation of the elixir is going to prepare by the simple solution method. It is a clear, sweetened, hydroalcoholic liquid intended for oral use.

Keywords: *Elixirs, Gymnema sylvestre, Sodium Saccharin, Diabetes, Herbal, Insulin.*

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INTRODUCTION:

Diabetes mellitus is a systemic metabolic disease characterized by hyperlipedemia, hyper aminoacidemia and hypoinsulinaemia, hyperglycemia, it leads to decrease in insulin secretion and insulin action. Diabetes is a heterogeneous metabolic disorder characterized by altered carbohydrate, lipid, and protein metabolism which causes hyperglycemia resulting from insufficient insulin secretion, insulin action or both. It is one of the refractory diseases identified by Indian Council of Medical Research for which an alternative medicine is a need for the treatment. Diabetes mellitus has become a major problem in the world.

India has today become the diabetic capital of the world with over 20 millions diabetes and this number is likely to increase. The World Health Organization (WHO) defines "Diabetes mellitus (DM) as a degenerative and chronic disease that occurs when the pancreas does not produce enough insulin, or when the body cannot effectively use insulin". It is a disorder of the metabolism of carbohydrates, fats, and lipids, which is characterized by a high fasting blood sugar. There are two main types of diabetes which are: 1) Type-1 diabetes (IDDM) ; 2) Type-2 diabetes (NIDDM).

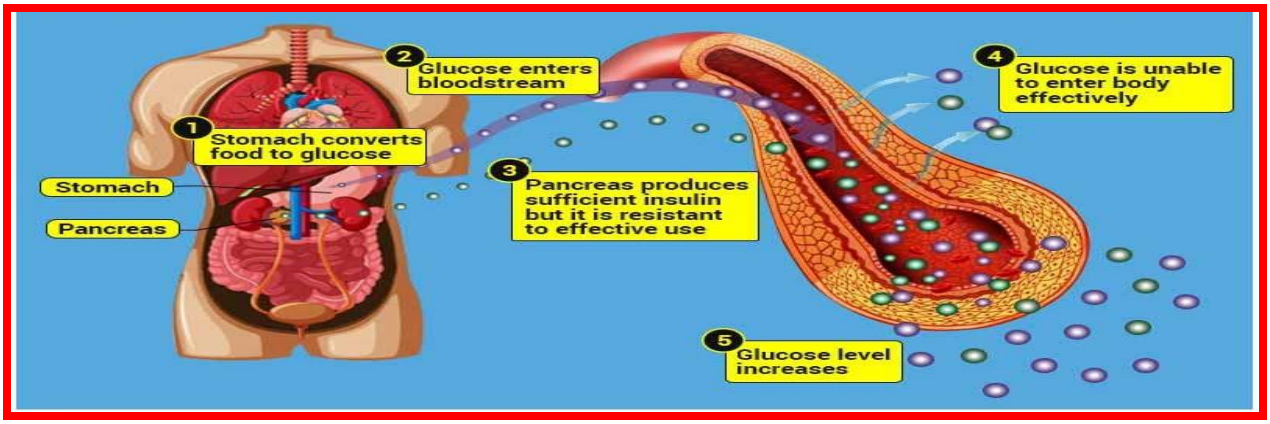


Figure No.1: schematic representation of Glucose levels in body

The Main Symptoms of Diabetes Mellitus i.e., increased thirst, Weight loss, increased urination, Hunger due to starvation of cells, Fatigue, Slow healing of wounds, Yeast infections, Tingling sensation in the feet or the toes [1-5].

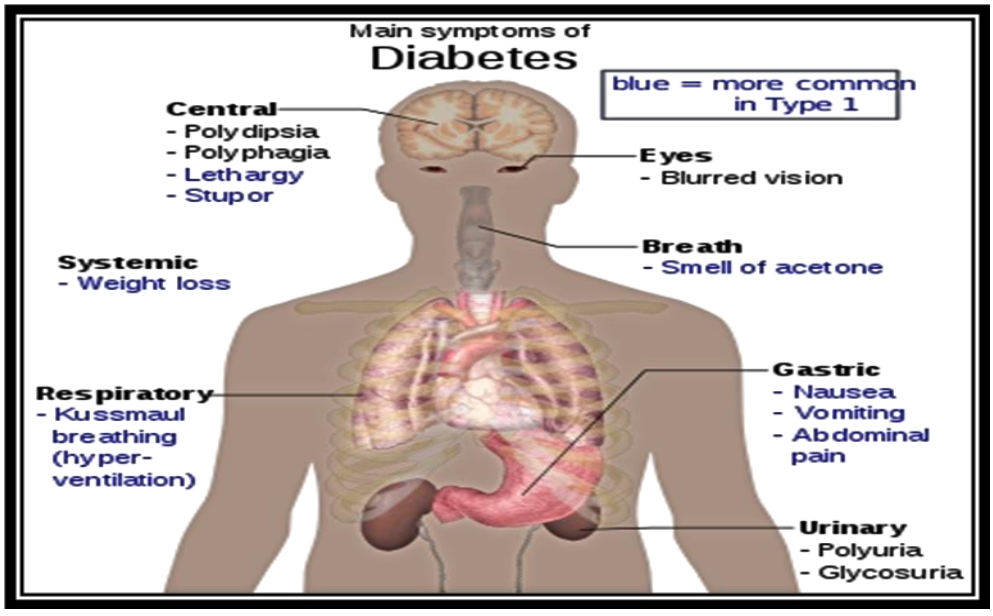


Figure No. 2: Symptoms of Diabetes

Adverse effect of anti diabetics allopathic drugs i.e., the main undesirable effect of insulin is that hypoglycemia can cause brain damage, Swelling, erythema and stinging occur specially in the beginning. Allergy to human by insulin is unusual but can occur. The commonest unwanted effects of metformin are gastrointestinal disturbances, abdominal pain, and metallic taste and the adverse effects of sulfonylureas are hypoglycemia, which can be severe and prolonged. The allergic skin rashes can occur, and bone marrow damage, although very rare can be severe. Thiazolidinediones causes serious hepatotoxicity, weight gain, gastrointestinal disturbances. These synthetic drugs are valuable but restricted by their limited action, and side effects. Advantages of herbal drugs over allopathic drugs, it is the plant based drugs are biodegradable, safe, and cheap, having fewer side effects. Ayurvedic medicines deal with permanently healing the person and effectively treating the disease. Allopathic treatment is to provide instant relief by destroying the germs, bacteria, virus etc; that caused the sickness. However, it cannot ensure that the disease will be cured permanently. Ayurvedic medicines mainly concentrate on the root cause of the problem to cure the specific system of our body; and hence we can maintain good health for a long time. While the Allopathy focuses on the symptoms and not the cause [6-10].

MATERIALS & METHODS:

MATERIALS [11-14]

The Gymnema sylvestre were collected from Local region, Latur, Maharashtra, India. Sodium Saccharin, Methyl paraben, Propyl paraben and Orange syrup was received as a gift sample from Research lab fine chemicals Mumbai. All other materials and chemicals used were of either pharmaceutical or analytical grade.

METHODS [15,16]

Stage 1) Preparation of active drug and vehicles:

i) Weight accurately of drug and excipients.
ii) Gymnemic acid powder is dissolved in 15 ml of alcohol
iii) Sodium sacchrine is dissolved in 20 ml of water with continuous stirring.

Stage 2) Mixing of solution:

The alcohol soluble ingredients and the water soluble ingredients dissolved in water are mixed.

Stage 3) Addition of preservatives and flavoring agents:

The preservatives like methyl paraben and propyl paraben and the flavoring agent like Orange syrup is added in above solution.

Stage 4) Preparation of final Elixir:

All ingredients are mixed in a beaker Stirred continuously on a magnetic stirrer for proper mixing of ingredients in solution.

Table No.-1: Formulation of Gymnema sylvestre Elixir

Sr. No	Ingredients	F1	F2	F3	F4	F5	F6	F7	F8
1	Gymnema Extract	2	2	2	2	2	2	2	2
2	Sodium Saccharin	0.075	0.075	0.2	0.2	0.3	0.5	0.5	0.5
3	Alcohol	15	15	15	15	15	15	15	15
4	Glycerin	-	-	1	1	1.5	1.5	1.5	2
5	Methyl paraben	-	0.015	0.015	0.1	0.025	0.15	0.2	0.2
6	Propyl paraben	-	-	0.01	0.015	0.015	0.015	0.02	0.02
7	Orange syrup	0.075	0.1	0.5	0.5	1	1	2	2
8	Water	Up to 100 ml	Up to 100 ml	Up to 100 ml	Up to 100 ml	Up to 100 ml	Up to 100 ml	Up to 100 ml	Upto 100 ml

Evaluation of Gymnema sylvestre Elixir [17-20]

Consistency (Viscosity):

The consistency of elixir should be clear and it was determined by using Brookfield viscometer at 30, 50, 60 rpm. For elixir the spindle number 64 was used. The sample was repeated three times.

pH:

The PH of various formulations was determined by digital pH meter the measurement of pH of each formulation was carried out in triplet and average values are represented. The pH of the Gymnemic acid elixir formulation was **6 -7 pH**

Refractive Index:

Refractive index of the elixir was measured by the Abbe's refractometer. The refractive index of the optimized batch of elixir (F8) was: **1.4623.**

Identification: Odour of chloroform separated

Alcohol determination: 90.0% -110.0% of the labeled amount was NMT 15% of alcohol (C_2H_5OH).

Assay: Acceptance criteria for Gymnemic acid elixir in between 90.0% to 110.0%

Table No. 2: Evaluation parameters of Elixirs

Sr No	Formulation	Viscocity (Centipoise) at (50 RPM)	PH	Refractive Index	Alcohol Content V/V	Assay (%)
1	F1	50 cps	6.1	1.4614	15 %	92 %
2	F2	50 cps	6.1	1.4614	15 %	90 %
3	F3	52 cps	6.2	1.4604	15 %	93 %
4	F4	55 cps	6.3	1.4625	15 %	94 %
5	F5	55 cps	6.4	1.4630	15 %	95 %
6	F6	56 cps	6.4	1.4625	15 %	94 %
7	F7	57 cps	6.5	1.4623	15 %	95 %
8	F8	60 cps	6.9	1.4623	15 %	92 %

FTIR STUDY:

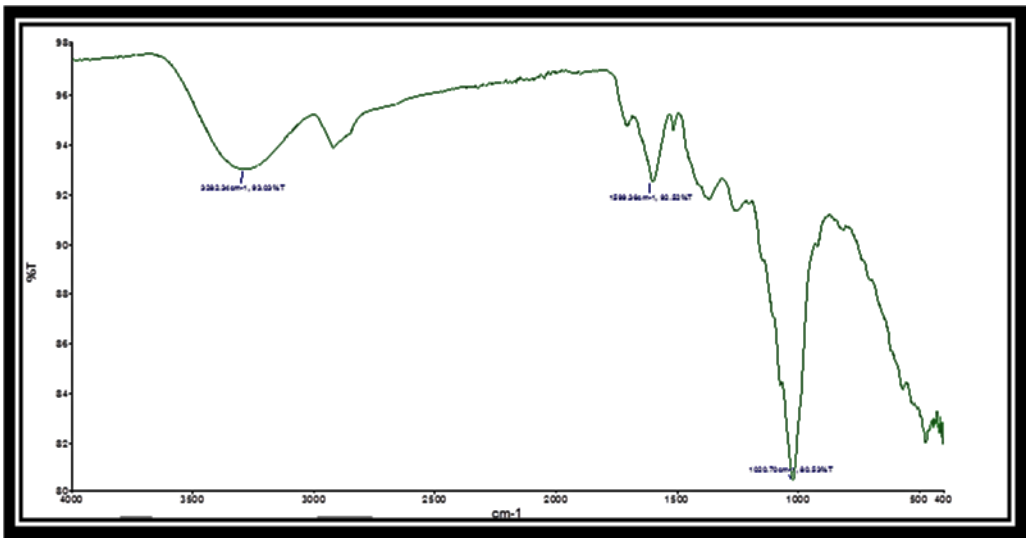


Figure No 3: FTIR spectra of Gymnema sylvestre leaf extract:

Table No. 3: Observation frequency of Gymnema sylvestre extract

Functional group	Standard Frequencies	Peaks Observed
N-H stretching	3500-3300	3282.34
C=C bending	1700-1500	1599.36

C-O stretching	1250-1050	1020.70

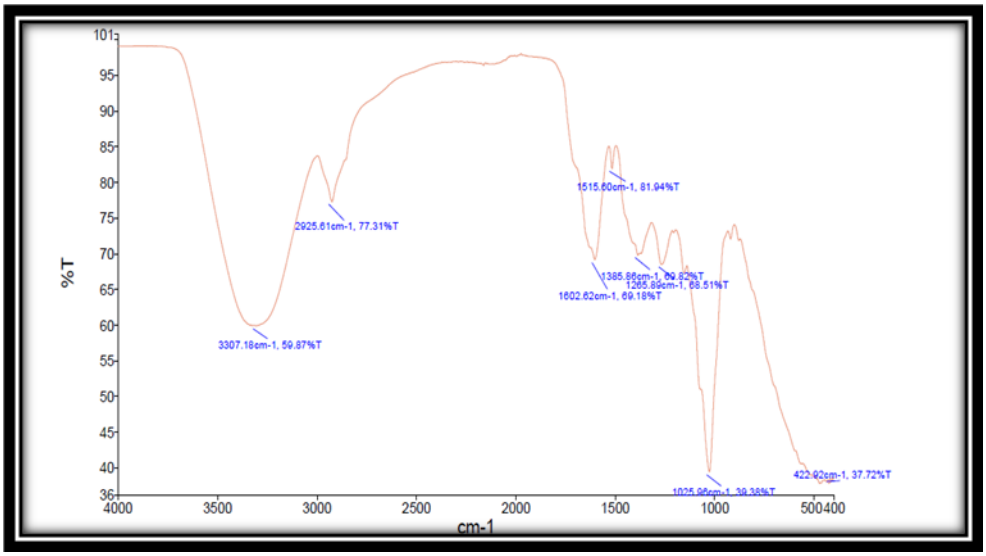


Figure No 4: FTIR spectra of Elixirs

Table No. 4: Interpretation of FTIR of elixir

Sr. No.	Functional group	Standard Frequencies	Observed Frequency
1	N-H stretching	3500-3300	3307.18
2	−O− H hydrogen bonded phenols	2500-3000	2925.61
3	Aromatic C = C	1700-1500	1515.60
4	Aromatic C = C	1700-1500	1385.86
5	C-C stretching mode	1250-1050	1265.89
6	C-C stretching mode	1250-1050	1025.96
7	C-H bending	860-680	422.92

DISCUSSION:

In the present study the work was an attempt to carry out standardization and extraction of active constituents of Gymnema sylvestre leaf. Also to formulate and evaluate G. S. leaf elixir. Formulation of Gymnema sylvestre leaf extract elixir done by Simple solution method varying drug concentration as F1–F8. Sodium Saccharin was used as sweetening agent and methyl paraben and propyl paraben was used as preservative in the formulation. All formulations were performed and their FTIR, Viscosity, PH, Refractive Index, Alcohol Content and Assay.

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