International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 01 Jan-Feb 2025, pp: 01-07 www.ijprajournal.com ISSN: 2456-4494

Review on Formulation and Evaluation of Herbal Antidiabetic Syrup

Swati Kale, Pooja Mhaske, Shaikh N.R.

Date of Submission: 01-01-2025 Date of Acceptance: 10-01-2025

ABSTRACT Herbs as potential source of therapeutic use.Herbal medicine are significant role in heath system.Ayurveda system are mention the varius use of herbal plants in the treatment of human disease.Diabetes mellitus is the systemic metabolic disease they caused by hyperglycemia,hyperlipidemia,it leads to decrease the secretion of insulin in the liver.Diabetes condition is the body does properly process. Diabetes mellitus in the pancrease does not produce insulin in the sufficient amount.

The aim of the present study was to investigate the phytochemical bioactive compounds of the metabolic extract of Sodium guajava leaves, ethenolic extract of Moringa oleifera leaves, methenolic extract of Clitoria ternatea flowers. M. oleifera for long has been used as a natural anti-diabetic herb in India and other Asian countries. Moringa oleifera is one of the popular plants that shown significant health benefits.Herbal medicine are the less side effects in human body and the involve the use of medicine they treat the disease and disorder.Herbal medicine are made by the wood,stem,leaves,fruits,flower or root.

Diabetes mellitus is one of the systemic metabolic disease around 2.8% of the world's population and is after the year 2025 cross the diabetes patient in the world 5.4%.The herbal medicines have been the highly esteemed source of medicine therefore, they have become a growing part of modern, high-tech medicine. In view of the above aspects the present review provides profiles of plants (65 species) with hypoglycemic properties

Keywords: Harbal syrup, anti-diabetic , diabetes mellitus,

I. INTRODUCTION

Herbal antidiabetic syrup is the liquid dosage form they are patient compliance for the difficult swallowing tablets or capsules.The herbal syrup are develop and research by provide the safe , effective and made by the natural alternative to manage the diabetes mellitus.

Diabetes mellitus is the sysremic endocrine metabolic disorders has caused significant morbidity and mortality due to micro vascular (retinopathy and nephropathy) and macro vascular (heart attack, stroke and peripheral vascular disease) complications . According to World Health Organization the diabetic population is likely to increase up to 300 million or more by the year 2025 .

Diabetes mellitus are caused by the availability of insulin in pancrease.The pancrease are insulin is no longer produced in sufficint amount in body they people eating sucrose.Blood glucose level by control the self medication and treatment. Herbal syrup are are used the treatment of diabetes mellitus.

According to WHO is the diabetes mellitus is the heterogeneous metabolic disorder the common feature of hyperglycemia with the disturbance of lipid , protein , carbohydrate , and fat metabolism.

Diabetes mellitus is the two type:-

1) Type-1:-Insulin- dependent diabetes mellitus (IDDM)

2) Type 2:- Non-insulin- dependent diabetes mellitus (NIDDM)

The medicinal herbal surup formulation of Moringa oleifera are ethanolic extract , Clitoriaternatea leaves are methanolic extract , Psidium gaujava leaves is the metabolic extract they are present the phytochemical bioactive compound. Moringa oleifera are the play the significant role of heath and their benefits. The antidianetic formulation are the reduce the glucose level in blood by inhibit the a-amylase and a-amylase enzyme.

Review of liturature MK Rai (1995): The control over diabetes mellitus depends upon the availability of insulin. Various efforts have been made in the recent past to control/check it.There is an inceasing demand to use natural herbal antidiabetic agent.The literature pertaining to antidiabetic herbs is scattered. The present article is a conglomeration of available indigenous literature.

International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 01 Jan-Feb 2025, pp: 01-07 www.ijprajournal.com ISSN: 2456-4494

Hau-zhou Huang(2021): Phyyllanthus emblica is a fruit widely consumed is a subtropical areas ,which is rich is poly phenols and other nutrients. According to new study ,its mechanisms include enhancing the functioning of insulin, resistances,activating the insulin-singnaling pathway, protecting B-cells,scavenging free radicals,alleviating inflammatory reactions and reducing the accumulation of advanced glycation and products.

BA Fatoumata, SENE Mohamet (2020): The incidence of diabetes has been growing over the years with serious and costly consequeces,both in terms of human and economic capital,particurly in low and middle income countries.Medicinal herbs could be useful included in the treatment of diabetes is an optimized strategy for better cost-effectiveness.

Omotayo O Erejuwa, Siti A Sulaimaya (2011): Evidences shows that honey improves glycemic control in diabetes mellitus.Besides its hypoglycemic effect, studies indicate that honey ameliorates lipid abnormalities in rats and humans with diabetes.The gut microbiota is mow recognized for its ability to increase energy harvest from the diet and alter lipid metabolism of the host.

Swati Deshmukh et.al (2013): Now days, in the whole there is turn towards the use of herbal products and to adopt to more natural way of life.People preferd natural food,herbal syrup,medicine and natural curing practice for healthy life,there is much crase for the vegetable products cultivatated organic farming without using synthetic fertilizer and pesticides.The use of herbalsyrup has been increase to many folds in personal care system and there is greate demand for the herbal syrup.

Objectives

To reduce symptoms of hyperglycaemia Reduce the risk of long-term complications of diabetes.Psidiun gaujavaleaves are metabolic extract they are antidiabetic activity.
Reduce the blood sugar level.

Signs and Symptoms

- ♣ Weight gain.
- ♣ Polyuria .
- ♣ Polydipsia
- ♣ Polyphagia
- ♣ Loss of vision.
- ♣ Slow healing of wounds.
- ♣ Itchy skin.
- ♣ Fatigue

Herbs:-A herbs is a plant or part of the plant such as leaves , seeds , roots , bark , fruits or flower they are therapeutic properties.Herbs have been used in traditional medicine by traet and manage the health .

Herbal preparations: Herbal preparations are the any formulation and product made by using plant and plant derived material for therapeutic , medicinal or health promoting. These herbal preparation are involve parts of plant such as leaves , flower , fruits , roots , stem , bark , and seeds they are extracts and are typically designed to retain the active constituients of the plant.

Herbal dosage forms: Herbal dosage form are various physical forms in which herbal medicines are prepared and administer to deliver the therapeutic effect. They are produced either from herbal materials (such as dried roots or fresh juices) or herbal preparations (such as extracts). These dosage form ae preserv the active ingredients of the herb and make the convenient for use , ensuring safety , efficacy , and patient compliance .

Post-harvest processing procedures

Poat harvest processing to the steps under taken after the harvesting herbs and medicinal herbal plant to preserve the quality , bioactive compond , therapeutic efficacy and use. Post harvest processing not only extends the shelf life of herbal material thet are also ensure the safety efficacy and consistency for pharmaceutical or commercial uses.

Harvesting
Sorting (garbling)
Primary processing
Cleaning
Leaching
Primary cuttingAgeing
Sweating Parboiling (blanching)
Sun drying
Shade-drying Dying by artificial heat Advanced cutting, sectioning and comminution
Preparation of herbal materials for processing

In general, for processes such as extraction, fractionation, purification and fermentation.

Extraction: Extraction is a process in which soluble plant chemical constituents (including those which have therapeutic activity) are separated from insoluble plant metabolites and cellular matrix, by the use of selective solvent (which is sometimes called the menstruum). Herbal extractionis the process of separating the bioactive constituents or

International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 01 Jan-Feb 2025, pp: 01-07 www.ijprajournal.com ISSN: 2456-4494

phytochemicals from plant material using appropriate solvent and techniques. Herbal extraction is a critical step in developing effective herbal medicines.

Common methods of extraction

1. Maceration
2. Infusion
3. Percolation
4. Decoction
5.Supercritical
6.Soxhelt extraction

Syrup

A syrup is a concentrated or nearly saturated sol;ution of sucrose in purifiend water. The concentration of sugar is 66.7%w/w. The syrup are sweet viscous preparation. Simple syrup contain 85% w/v (65% w/w); specific gravity 1.313 (USP) or 66.7% w/w as per Indian Pharmacopeia/BP.

Simple syrup	Medicated syrup	Herbal syrup
Syrup is viscous, concentrated or nearly saturated aqueous solution of sugar containing 66.7% w/w of sugar.	Medicated syrups are nearly saturated solution of sugar in water in which medicaments and drugs are dissolved. It is intended for oral use. They containing medicinal substance are called as medicated syrup.	Herbal syrup Is prepared by mixing a concentrated decoction with either honey or sugar or alcohol. It is intended for oral use. Herbal syrups shows a more potent action then other types of syrup .

Advantages

♣ Good patient compliance .
♣ They are palatable .
♣It prevent decomposition of many vegetable substance.

Disadvantages

♣Risk of contamination.
♣ Not suitable in emergency and unconscious patients.
♣Bitter and unpleasant taste.

Ideal properties

1.Physiological inert.
2. Physiologically stable.
3. Do not impact any undesirable taste ,colour and odour.
4. Non-toxic, non-irritant and non-sensitizing.
5. Effective in low conc.
6. Free from micro-organism .
7. Non interfere with bioavailability of the drug .
8. Accepted by regulatory authorities.

Mechanism of action The mechanism of action of a herbal antidiabetic syrup typically attributed to the synergistic effect of a bioactive compounds present in its ingredients These mechanisms often target various pathways involved in glucose metabolism, insulin sensitivity and oxidative stress.Herbal formulation inhibit the enzyme a-glucosidase and a-amylase, which are responsible for carbohydrate digestion.This reduces postprandial blood glucose level by slowing carbohydrate breakdown. Plant derived metabolites exert their effects various mechanism including prevention of glucose absorption from the intestine due to the inhibition of intestinal a glucosidase and pancreatic a-amylase,functional b-cell restoration,insulin secretion and expression improvement ,decrease in insulin.

Ingredients used in polyherbal syrup

Following ingredints are used in Polyherbal Antidiabetic syrup

Moringa Oleifera leaf Synonyms:-Drumstick tree,miracle tree, gulandiya mooring

Biological source:-It consists of dried leaves of Moringa Oleifera.

Family:-Moringaceae

Chemical constitunets:-It also contain an bioactive phytochemicals, such as polysachharides, flavonoids, alkaloids, glucosiniloids and isothicyanates.

Uses:-1.It is used in asthma, diabetes,breast-feeding and may other purpose.
2.They help protect cells from damage

International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 01 Jan-Feb 2025, pp: 01-07 www.ijprajournal.com ISSN: 2456-4494

Fig. Moringa Oleifera leaf

Psidium guajava leaves
Synonyms:- Peru, guava, jambu batu
Biological source:-It consist of dried leaves of Psidium guajava.
Family:-Myrtaceae
Chemical constituents:-It also contain flavonoids,tannins, vitamins, carbohydrades, fiber fatty acid,and glycosides.
Uses:-1. It is used in treatment of gastrointestinal diseases.
2.They also used in diabetes and wound healing.

fig.Psidium guajava leaves

Clitoria ternatea flower
Synonyms:- Butterfly pea, darvin pea, cordofan tree.
Biological source:- It consist of dried flower of clitoria ternatea.
Family:-Fabaceae
Chemical constituents:- It also contain tannins, triterpenoids, phenols, glycosides,proteins,anthocyanins.

Excipient profile

Uses:- 1. It is usesd in reduce blood sugar level.
2. They are used in glaucoma, blurred vision.

Fig.Clitoria ternatea flower

Emblica officinalis gaertnSynonyms:-Indian gooseberry, amla
Biological source:-It consist of dried as well as fresh fruits of the plant Emblica officinalis.
Family:-Euphorbiaceae
Chemical constituents:-It contains gallic acid,ellagic acid gallo tannin,rutin,linoleic acid,mystic acid.

Uses:-
1. It is used in diabetes, heart disease, and cancer.
2. They improve the skin health aid in digestion

fig.Emblica officinalis gaertn

International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 01 Jan-Feb 2025, pp: 01-07 www.ijprajournal.com ISSN: 2456-4494

Sr.No.	Excipints	Uses
1.	Propylene glycol	Food additive,Drug stabilizer
2.	Methyl paraben	Preservative
3.	Peppermint oil	Flavouring agent
4.	Amaranth solution	Colouring agent
5.	Honey	Sweetening agent,Thickening agent
6.	Purified Water	Vehicle

Formulation of Herbal Antidiabetic Syrup[100ml]

Sr.no	Ingredints	Quantity taken
1.	Moringa oleiferaleaves powder	1 gm
2.	Clitoria ternatea flower powder	1 gm
3.	Phyllanthus emblica fruit powder	1 gm
4.	Psidium guajava leaves powder	1 gm
5.	Methyl paraben	5 gm
6.	Propylene glycol	5 ml
7.	Peppermint oil	3 ml
8.	Amaranth Solution	0.3 ml
9.	Honey	66.7 gm
10.	Purified Water	Up to 100 ml

- **Anti-Diabetic herbal syrup is prepared by using the following three steps**

Step 1: **Method of preparation of decoction**

♣1 gm of Moringa leaves powder + 1 gm of Clitoria ternatea flower powder + 1 gm of Phyllanthus emblica fruit powder + 1 gm of Pisidium guajava leaves powder.

♣ Mixed in 200 ml of purified water.

♣ Boil until total volume becomes 1/4th of initial volume.9 they initial valume of decoction by the 50 ml).

♣ Then cool the decoction.

♣ After cooling filter with filter press.

Step 2: Method of preparation of simple syrup

♣ Mix 66.7%w/w of honey in required quantity of distilled water to prepare a concentrated solution of simple syrup. (up to 100 ml)

Step 3: Method of preparation of herbal syrup

♣ Filtrate was taken and added to simple syrup yield final syrup.

♣ For the preparation of final herbal syrup, mix by the simple syrup.

♣ Then add excipient and finally make up the value to 100 ml with purified water.

Evaluation parameter

1. Colour: Colour examination is done by observing the syrup directly with our naked eye .

2. Odour: 5 ml of final syrup was smelled individually then the odor can be detected.

3. Taste: A pinch of final syrup was taken on taste bud of tongue to detect the taste.

4. Determination of pH: Take 10 ml of final syrup in the volumetric flask and make up the volume up to 100 ml with distilled water. The pH was measured by using digital pH meter.

5. Determination of viscosity: Viscosity of syrup can be determined by using Ostwald viscometer. First clean the Ostwald viscometer thoroughly with warm chromic acid or acetone Place the viscometer in vertical position on a suitable stand now fill the water up to mark “G” in dry viscometer. Note the time required for water to flow from mark A to mark B. For at least three times, repeat the filling process and note the time to obtain accurate readings. Now rinse the viscometer and fill it with test liquid (syrup) till mark a, find out the time required for liquid to flow to mark B. The density can be determined by using specific gravity bottle.

International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 01 Jan-Feb 2025, pp: 01-07 www.ijprajournal.com ISSN: 2456-4494

Formula for viscosity = Density of test liquid × Time required to flow test liquid × Viscosity of water
Viscosity = Density of water × Time required to flow water.

6. Determination of density:

The density of syrup can be determined by using specific gravity of bottle. Clean the specific gravity bottle thoroughly with chromic acid or nitric acid. With the distilled water rinse the bottle for two to three times. Note the weight of empty dry bottle with capillary tube stopper (w1). Now fill the bottle with UN know liquid and place the stopper and wipe of the excess liquid outside the bottle with unknown liquid in analytical balance (w2). Finally calculate weight in grams of UN known liquid.

Density of liquid under test (syrup)=Weight of liquid under test/Volume of liquid under test

7. Determination of specific gravity: Rinse the bottle for two to three times with purified water after cleaning it with chromic acid or nitric acid. If requires rinse the bottle with acetone and dry it. Take the weight of empty dry bottle with capillary tube stopper (w1). Fill the bottle distilled water and place stopper; wipe off excess liquid from outside of tube. And weigh the bottle with distilled water on analytical balance (w2). Repeat the same procedure by replacing water with liquid under test (syrup) after emptying and drying. Weigh the bottle with stopper and liquid under test on analytical balance (w3).

Evaluation Test

Sr.No.	Evaluation parameters	Test
1.	Colour	Slightly brown
2.	Odour	Pleasant
3.	Test	Sweet
4.	pH	6
5.	Viscosity	0.25 poise
6.	Density	14.5 gm
7.	Specific	

II. CONCLUSION

The study demonstrated that the formulated the herbal syrup exhibits the significant antidiabetic activity , likely due to the synergistic effect of its phytochemicals constituents. By targeting multiple pathways involved in glucose regulation , the formulation provides a promising alternative to synthetic antidiabetic drugs , with potential adavntages in safety , tolerability , and cost effectiveness .

The prepare Anti diabetic herbal syrup by using leaf extract of Moringa oleifera, Psidium guajava, flower extract of Clitoria ternatea and Fruit of Phyllanthus emblica. Moringa lowers cholesterol levels by increasing good cholesterol in the body. It is also good for diabetics as it helps lower blood sugar levels.

Phytochemicals analysis and preliminary in-vitri or in-vivo studies suggest that the herbal syrup contain bioactive componds that enhance insulin sensitivity , promote glucose uptake and reduce oxidative stress . This highlights the therapeutic value of plant based remedies in diabetes management. Diabetes mellitus is the fastest growing systemic metabolic disease . Herbs are manage the diabetes and their complication.

Future studies focusing on clinical trials, dosage optimization and long term safety assessments are recommendes to validate the the efficacy of the formulation and establish its place in diabetic care.

REFERENCE

[1]. Patel DK, Kumar R, Prasad SK, Sairam K, Hemalatha S. Anti-diabetic and in vitro

antioxidant potential of Hybanthus enneaspermus (Linn) F. Muell in streptozotocin-induced diabetic rats. Asian Pac. J Trop. Biomed. 2011;1(4):316–322.

[2]. Sy GY, Cissé A, Nongonierma RB, Sarr M, Mbodj NA, Faye B. Hypoglycaemic and anti-diabetic activity of acetonic extract of Vernonia colorata leaves innormoglycaemic and alloxan-induced diabetic rats. J Ethnopharmacol. 2005;98(1-2):171–175.

[3]. Korem Raju, A Sharone Rose, B Rohini, P Sahaja, G Shylaja, SaifaSimran. Formulation and Evaluation of Anti-Diabetic Herbal Syrup. Res. J Pharmacognosy Phytochem. 2020;12(3):141-144. DOI: 10.5958/0975-4385.2020.00023.0

[4]. Manikandan R, Anand A V, Muthumani G D. Phytochemical and in vitro anti-diabetic activity of methanolic extract of Psidium guajava leaves. Int. J Curr Microbiol App Sci. Available from: https://www.ijcmas.com/

[5]. Patel DK, Prasad SK, Kumar R, Hemalatha S. An overview on antidiabetic medicinal plants having insulin mimetic property. Int. J Pharmacogn Phytochem. Available from: https://www.ijppjournal.com/

[6]. Kalaiselvi K, Vidhya Rekha U, Rajagopal P, Sekar D, Jayaraman S. Anti-diabetic activity of Clitoria ternatea Linn. Available from: https://www.researchgate.net/

[7]. Rajamanickam M, Kalaivanan P, Sivagnanam I. Evaluation of Anti-oxidant and Anti-diabetic Activity of Flower Extract of Clitoria ternatea L. Available from: https://www.researchgate.net/

[8]. Mehta S, Singh RK, Jaiswal D, Rai PK, Watal G. Antidiabetic activity of Emblica officinalis in animal Models. Available from: https://www.researchgate.net/

[9]. Sridhar KR, Bhat R. Potential effect of tropical fruits Phyllanthus emblica L. for the prevention and management of type 2 diabetic complications: A systematic review of recent advances. J Food Sci. Technol. 2019;56(5):2197–2210

[10]. 10.Wikipedia, The free encyclopedia. Diabetes mellitus, 2009 Nov; Available from http://en.wikipedia.org/wiki/diabetes mellitus.

[11]. Riaz S, Diabetes mellitus: A rewiew. Scientific Research & Essay ,2009 ;4:367-373.

[12]. S.K.Tiwari,A Singh By "Herbal Medicines for DIABETES Management "

[13]. http://www.researchgate.net /publication/364164171-