IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 4, November 2024

Formulation and Evaluation of Fast Dissolving Polyhebal Antidiabetic Tablet of Syzygiumcumini and Zingiberofficinale

Chormale Arti Dhondiram, Paste Gitanjali Rajebhau, Pawar Nandini Gorakh, Dr. L. D. Hingane
Aditya Pharmacy College, Beed, Maharashtra, India

Abstract: *Diabetes mellitus is a silent killer of mankind , that leads to huge economic loss in a developing country like India. There is a need for better treatments with less adverse effects to minimise the burden on the health and Economy of an individual and the society. Traditional Medicines derived from medicinal plants are used by about 60% of the world's population. This Project work focuses on Indian Herbal drugs and plants used in the treatment of diabetes, especially in India. Diabetes is an important human ailment affecting many from various walks of life in different countries.This project is to make an effective solution on Diabetic condition and Edema with better therapeutic effects with minimum side effects.Fast dissolving drug delivery system offers a solution for those patients having difficulty in swallowing. The concept of Fast dissolving Drug Delivery System emerged from the desire to provide patient with more conventional means of taking their medication.*

The Utilization of herbal medicines for the management of diseases has provided admirable results. Plant extracts are rich in like polyphenols, alkaloids, glycosides, flavonoids, and terpenoids having specific health benefits. Diabetes mellitus (DM) is a non-communicable disease with a worldwide accurance, characterized by persistent hyperglycemic conditions. Several oral hypoglycemic drugs viz. sulfonylureas, biguanides, α-glucosidase inhibitors, and non-sulfonylureas secretagogues are common medical recommendations for controlling diabetes.

Diabetes is the one of the most common disorder is universe. So treating the diabetes is a global problem. Many of the drugs commercially available in market to treat diabetes, however these are the drugs has associated with side effects and toxicity. So that using of herbal therapy as an alternative to treating of diabetes with less side effects and diabetes.

Keywords: Diabetes

I. INTRODUCTION

Diabetes mellitus is one of the leading Metabolic diseases affecting almost 50% of elderly Population and a cause of death. The increase in cost With time is due to the increase in complications. The Costs of diabetes affect everyone, everywhere, and are a Major financial problem .Various studies were conducted in India for Economic burden of diabetics treatment which include Direct diabetics treatment and its related complications.

Diabetes is a metabolic disorder characterized by high glucose or above-normal glucose level (70–110 mg/dL) symptomatically with frequent urination, thirst, and hunger. The main causes are either less production of insulin by β-cells or reduced cell response to insulin (Singab, Youssef, &Ashour, 2014). Diabetes along with other cofactors increases the risk of obesity, heredity, aging, genetic mutilation of beta-cell function/insulin receptor, drug, and infection. According to International Diabetes Federation (IDF) survey report in 2016, approximately 415 million people were diabetic with a predicted population of 642 million to suffer from type 2 diabetes by 2040 (Al-Malki& El Rabey, 2015). In India, Aroma World reported 61.3 million diabetic people between the age group of 20–79 years and is further expected to increase by 2030. Diabetes is classified into 3 types according to the pathological causes: type 1 (T1DM) which characterized by less production of insulin due to damaged beta cell, type 2 (T2DM) that can affect any age group due to development of a condition where body becomes irresponsive or resistant of insulin and the third type is gestational diabetes that occurs during pregnancy (Monika, Sharma, & Yadav, 2016). Diabetes develops with time

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 4, November 2024

due to some specific health-related issues or might result from some external factors (environmental factors) which alone or in symbiotic association aggravates the complications, resulting in cardiovascular diseases, kidney diseases, eyes problem and ulceration of feet .Continuous research efforts over the time have improved our understanding of the pathophysiology of diabetes and the scientists have successfully developed multiple pharmacological and non-pharmacological approaches for improving the glycemic control of the body (Tahrani, Piya, Kennedy, & Barnett, 2010). The disease however, is very versatile with varied expression and progression which makes its control very difficult. Improvement of glycemic control using physiological aids may be the last option in the long list of treatments available. However, the adoption of healthy food choices for the overall management of health and a disease condition, in particular, becomes even more important (Jacobson, 2004; Tahrani et al., 2010).

The development and progression of T2DM is mostly correlated with food habits. Once T2DM is diagnosed, the most important and critical part of treatment is lifelong adoption and close adherence to multiple self-care advice particularly by modification of dietary habits suggested by dieticians (Rao, Sreenivasulu, Chengaiah, Reddy, &Chetty, 2010). According to the Acharya Charak, a diet should be consumed which, besides providing basic nutrition to the body, can also help to maintain the healthy state of the body and prevents the occurrence of diseases (Daliu, Santini, & Novellino, 2019). Plant foods are rich in various bioactive functional compounds with a range of health benefits. The functional foods are not only important for physical and mental well-being but result in prophylactic prevention and reduction of several diseases. The growing interest in functional foods for health management as verified by several epidemiological studies has revealed that certain bioactive food components are linked to lower risk of diabetes (Santini&2017b, Santini and Novellino, 2017c).

II. REVIEW LITERATURE

1. Rakesh Pahwaet.al (2017): They have study the super disintegrants used in the development of orally disintegrating tablets describes Orally disintegrating tablets are an emerging trend in novel drug delivery system and have received ever-increasing demand during the last few decades. The field has become a rapidly growing area in the pharmaceutical industry and gaining popularity due to ease of administration and better patient compliance especially for geriatric and pediatric patients.

2. Martins Emejeet.al (2011): They studied compaction characteristics of the extract using the Heckel equation. The mechanical properties as well as disintegration and dissolution profile of the compacts were also assessed. The results showed that ADI exhibited very low densification due to dye filling and addition of filler-binders contributed significantly to their subsequent densification. The tablets produced had good mechanical properties

3. Vikas Kumar Gupta et.al (2021): They studied on zingiberofficinale Roscoe, the scientific name for ginger, is a plant that in widely used as a spice, flavoring, and herbal treatment across the world. It is a member of the Zingiberezae family and traditional uses,

T. Sampath Kumar etal (2021): They studied on formulation and Evaluation of in vitro antidiabetic Polyherbal tablets from some traditional used Herbs And describes Diabetes Mellitus is defined as heterogenous metabolic disorder charachterised by common feature of chronic hyperglycemia with disturbance of carbohydrate, protein and fat metabolism. Tablets are defined a solid preparations intended for oral administration, each containing a single dose of one or more active ingredients. Tablets an prepared by compaction and contain drugs and formulation additives.

4. Sable KundanDattatrayet.al (2020): They find patients might be drawn to the use of herbal remedies because they are encouraged to think of them as natural remedies, free from adverse effects. A 58-year-old woman of south Asian origin, with a 30- year history of type 2 diabetes, together with hypertension, hyper cholesteroaemia, chronic kidney disease, retinopathy, and a painful peripheral neuropathy, attended our clinic in November, 2017.

Aim:

Formulation and evaluation of fast dissolving polyhebal antidiabetic tablet of syzygiumcumini and zingiberofficinale.

Objective:

a) Review disease process of Diabetes mellitus.

b) Discuss the role of insulin in metabolic process.

c) Discuss different types of anti-diabetic agents with their mode of action, side effects and care.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 4, November 2024

d) List the principles of therapy for all anti-diabetic agent
e) State the reasons for combinations of insuli and oral hypoglycemic agents.
f) for better complaince of patients.
g) to reduce edema and maintain blood glucose levels.
h) to reduce inflammation in edema.

III. MATERIAL AND EQUIPMENT

Name of Material

Sr.no.	Name of material
1	Syzygiumcumini (jamun seed powder)
2	Zingiberofficinale ginger
3	Guggula
4	Monk fruit

Name of chemicals

Sr.no.	Name of chemicals
1	MCC
2	Talc

Name of equipment :

Sr.no.	Name of equipment
1	Dissolution apparatus
2	Disintegration apparatus
3	PH meter
4	Weighing balance
5	Tablet punching machine
6	Hardness tester
7	Friability tester
8	Tablet thickness tester
9	Sieve and sieve shaker machine

Drug and excipients profile :
Jamun –
Synonym: Jambul, Jambolan, Jamblang or jamun.
Biological source: It is the fruit of Syzygium cumin tree.
Family: Myrtaceae
Botanical Description: The jambolan is native in India, Burma, Ceylon and the Andaman, Islands.
Chemical constituents: Fruit is rich in compounds containing anthocyanins, glycoside ellagic acid, kaenferol and myercertin.
Uses: Anti-inflammatory, Bark and seeds used for diabetes which reduce blood sugar level quickly.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 4, November 2024

Ginger :
Synonym: Gingerin. Rhizomazingiberis, Zingibere, Ginger Officinale
Biological source: The ginger is the rhizomes of Zingiberofficinale, Roscose and dried in the sun.
Family: Zingiberaceae
Botanical Description: The ginger sre mostly cultivates in India, Japan, Nigeria, Jamaica, West Indies and Africa.
Chemical constituents: The ginger is consist with 1-2% of volatile oil, 5-8% pungent principle, starch and resinous mass.
Uses: Pain relief from rheumatoid arthritis (RA), Diabetes, Migraine headache, Osteoarthritis.

Guggula:
Synonym: Guggul, Devadhoop, Kaushika, Indian bdellium tree, scented bdellium.gumgurgul.
Biological source: Oleo gum resins from the bark of commiphoramukul.
Family: Burseraceae
Botanical Description: Guggal is a spiny shrub or small tree with many branches, usually growing two or three meters high, that is native to India, Arabia and Pakistan.
Chemical constituents: Guggulu contains diterpenoids, triterpenoids, steroids, long-chain aliphatic tetrols, aliphatic esters, ferulates, lignans, carbohydrates.
Uses: Modern therapeutic uses of guggul include nervous diseases, leprosy, ulcerative pharyngitis, hypertension and urinary disorders.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 4, November 2024

Monk fruit –
Synonym: Momordicagrosvenorii Swingle and Thladianthagrosvenorii (Swingle) C. Jeffrey
Biological source: Monk fruit is a natural sugar alternative derived from the Siratiagrosvenori plant.
Family: Burseraceae
Botanical Description: The cultivation of 'monk fruit" brought from China has started in Kullu, Himachal Pradesh.
Chemical constituents: Cucurbitane glycosides, mogrosides, are the main components of the S. grosvenorii fruit and mogroside V is the main mogroside in the Monk fruit extract.
Uses: Prevent obesity, cancer, diabetes, blood sugar management, sweetener in baverages dressings inflammation & antioxidants.

IV. METHODOLOGY

1. Phytochemical Screening.
2. Preformulation Study:
Solubility
Dissolution
Bulk density
Excipients compatibility
Stability study
Flow property.
3. Identified preparation method
Direct compression for fast dissolving tablet:
Blending
Dry Granulation
Milling
Lubrication
Compression
Packaging

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 4, November 2024

Formulation table of syzygiumcuminiand gingiberofficinale tablet

Formulation table of 500mg antidiabetic polyhebal tablet .

Sr.no.	Ingredients	F1(mg)	F2(mg)	F3(mg)	F4(mg)
1	Jamun seed powder	200	200	200	200
2	Dried ginger powder	150	150	150	150
3	Mcc	85	100	120	110
4	Monk fruit	20	20	10	20
5	Guggula Powder	15	20	10	10
6	Talc	30	10	10	20

Evaluation testing parameters :

Organoleptic properties
Thickness
Hardness
Friability
Weight variation
Disintegration test.

V. RESULT AND DISCUSSION

Formulation and evaluation of polyhebal antidiabetic tablet of syzygiumcumini and gingiberofficinale tablet was performed .

Sr.No.	Name of plant	Colour	Odour	Taste
1	Jamun	Dark purple	Characteristic	Tart and sweet
2	Ginger	Internally pale yellow to brown	Aromatic	Pungent
3	Guggula Powder	Transparent golden brown to dark brown	Aromatic	Bitter and sweet
4	Monk fruit	Brown to green	Slightly burnt smell	Sweet

VI. CONCLUSION

Preformulation studies of herbal table containing syzygiumcumini ,zingiberofficinale, monk fruit, guggulaand prepared four herbal formulation were studied and showed a satisfactory result in evaluation. From this study, it can confirm that the prepared Herbal tablet formulations are cost effective having less side effect and easily available drugs. So that, our poor Indian. People can afford this type of medicine rather than costly modern medicine.

VII. ACKNOWLEDGEMENT

We would like to express our gratitude to Faculty of Pharmacy, Faculty of Pharmacy, Dr Babasaheb Ambedkar Technological University Lonere, Maharashtra, for offering the opportunity to conduct project work on a herbal tablet We also want to express our gratitude to the faculty members who helped us along the way.

REFERENCES

[1]. Khan CR, Shechter Y. Insulin: Oral hypoglycemic agents and the pharmacology of endocrine pancreas, in Goodman and Gillman's The Pharmacological Basis of therapeutics. 8th ed. New York: Pergaman Press: 1991. P. 1463.

[2]. Marles RJ, Farnsworth NR. Plant to patients: An ethnomedical approach. Phytomedicine 1995;2:137.aswatha RH, Kaushik U, Lachake P, Shreedhara CS, Pharmacognosy Research 2009;4:224-7.

[3]. Mukharjee PK. Quality Control of Herbal Drugs. New Delhi: Business Horizons Pharmaceutical Publishers; 2008. P. 186. LP.

[4]. Unnikrishnan R. Anjana RM, Mohan V. Diabetes mellitus and its complications in India. Nat Rev Endocrinol2016;12(6):357-70. 5.Tomy S, Azeez A, Abdalla FMA, Suresh R, Johnson B. Antidiabetic effect

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 4, November 2024

of Polyherbalformulatio"KathakakhadiradiKashyam" in Streptozotocin induced Diabetic rats. J Young Pharm 2016;8(4):496-99.

[5]. Dwivedi C, Daspaul S. Antidiabetic herbal drugs and Polyherbal formulations used for diabetes: A review, J Phytopharmacol 2013;2(3):44-51.1770

[6]. Antora RA, Salleh RM. Antihyperglycemic effect of Ocimum plants: A short review. Asian Pac J Trop Med2017;7(8):755-59

[7]. Balammal G, Sekar BM, Reddy JP. Analysis of Herbal Medicines by Modern Chromatographic Techniques. Int J Pre Pharm Res 2012:3(1):50-63.

[8]. Prabhu TP, Panneerselvam P, Kumar RV, Atlee WC, Subramanian SB. Anti-inflammatory, anti-arthritis andAnalgesic effect of ethanolic extract of whole plant of MerremiaemarginataBurm.F. Cent Eur J Exp Biol2012;1(3):94-99.

[9]. Patel P. Patel D. Patel N. Experimental investigation of anti-rheumatoid activity of Pleuriticsajor-caju in adjuvant -induced arthritic rats. Chin J Nat Med 2012;10(4):269-74.

[10]. Thillaivanan S, Samraj K. Challenges, constraints and opportunities in Herbal Medicines- A Review. Int J Herb Med 2014;2(1):21-24.

[11]. Arutselvi R. Balasarvanan T, Ponmurugun P. Saranji NM, Suresh P. Phytochemical screening and comparative study of anti microbial activity of leaves and rhizomes of turmeric varieties. Asian J Plant Sci Res2012;2(2):212-19.

[12]. Dasaroju S, Gottumukkala KM. Current trends in the research of Emblicaofficinalis (Amla): A pharmacological perspective. Int J Pharm Sci Rev Res 2014:24(2):150-59.