

# FORMULATION AND EVALUATION OF ALOE VERA EXTRACT TABLETS

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**Abstract:** Since the beginning of time, people have employed natural remedies made from plants, animals, microbes and marine organisms to delicacy and avert disease. Aloe vera, (*Aloe barbadensis* Family: *Liliaceae*) also known as the Medicinal Aloe, is a species of succulent plant that probably originated in northern Africa. It grows mainly in the dry regions of Africa, Asia, Europe and America. In India, it is found in Rajasthan, Andhra Pradesh, Gujarat, Maharashtra and Tamil Nadu, Direct compression is the simplest and most economical method for the manufacturing of tablets using Aloe vera powder. Metformin HCl formulation was found to be in compliance with all the properties of powders and exhibit satisfactory results. From the carried out study, it can be concluded that the formulation of Metformin HCl tablets by using *Aloe-Vera* powder was prepared well and had all the required necessary properties.

Key words: Aloe vera extract, metformin tablets, direct compression method.

## INTRODUCTION

The bioactive molecules in ayurvedic medicines are derived from plant parts like leaves, roots, or flowers[1] Since the beginning of time, people have employed natural remedies made from plants, animals, microbes and marine organisms to delicacy and avert disease [2,3]. Archaeological record show that humans have been using plants as remedies for at least 60,000 years. Traditional medicine is too valuable to be ignored in the research and development of modern drugs. However, usage of traditional remedies increases when conventional medicine is ineffective in the treatment of disease, such as in advanced cancer and in the face of new infectious diseases. Since medicinal plants represent the "backbone" of traditional medicine, over a billion people in less developed nations regularly use these resources. These medicinal plants are regarded as a rich source of constituents for the creation and synthesis of medications. Furthermore, the extraction and creation of various medicines and chemotherapeutics from these plants as well as from extensively used rural herbal remedies has been linked to an increase in the reliance on the usage of medicinal plants in industrial nations.[3] Each plant provides a variety of vital components that can be deployed in the medical establishment and used to create various types of pharmaceuticals. [4]

Aloe vera, (*Aloe barbadensis* Family: *Liliaceae*) also known as the Medicinal Aloe, is a species of succulent plant that probably originated in northern Africa. It grows mainly in the dry regions of Africa, Asia, Europe and America. In India, it is found in Rajasthan, Andhra Pradesh, Gujarat, Maharashtra and Tamil Nadu[5]. The traditional Medical Applications of Aloe Vera are Lowers blood glucose level. antioxidant and antibacterial

properties, accelerates wound healing, reduces dental plaque., reduces constipation, may improve skin and prevent wrinkles, Substituent of mouth wash, Used after waxing, Moisturizer for skin.

Numerous publications asserted that aloe had anti-diabetic and antioxidant properties when used to treat experimentally induced diabetes. [6]. Different insights content that treating diabetes should include both antioxidant protection of the  $\beta$ -cell and insulin secretion. This might make it easier for  $\beta$ -cells to recover from oxidative stress damage brought on by hyperglycemia. [7]

**MATERIALS AND METHODS:**

Metformin HCl was obtained from MSN Laboratories Hyderabad, India. Aloe vera powder is prepared, Povidone and Magnesium Stearate used throughout the study were of analytical grade and were used as received.

**PRE-FORMULATION STUDIES:**

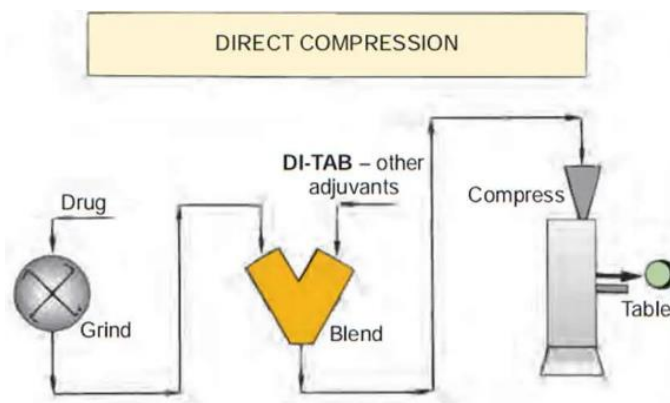
Various flow property pre-compression studies were carried out prior to the direct compression method of Metformin HCl tablet production using *Aloe vera* powder. The pre-compression parameters like angle of repose, bulk density, tapped density, Carr's index and Hausner's ratio were evaluated according to the standard procedures. [8] by using the Ingredients given in Table 1 Aloe vera powder is made into tablets form.

**Table no-1 Composition of Metformin HCL Using Aloe Vera Powder:**

S. No	Quantity for each tablet	Quantity for 20 tablets
Metformin HCl	500mg	10g
Aloe vera Powder	120mg	2.4g
Povidone	30mg	600mg
Magnesium Stearate	6mg	120mg

**Method: Direct Compression Method**

Direct compression is the simplest and most economical method for the manufacturing of tablets because it requires less processing steps than other techniques.[ 8], hence this method is chosen for carrying out tablets punching process [9]. Each powder is accurately weighed and sieve the powders through sieve no100 and are taken into the mortar and pestle and continuously mix to get uniform powder.



Each Tablet is prepared by compress individually powder in each packet under direct compression method obtained were evaluated for formulation studies.

**Post formulation Evaluation Studies of Metformin HCL**

post-compression parameters like General Appearance (Organoleptic characters), Content uniformity, Hardness, Weight Variation, Friability, Disintegration time, Dissolution Studies were evaluated according to the standard procedures. [10,11.]

**Results and Discussion**

**Pre compression studies Results:**

Angle of Repose: 55.3 degrees

Bulk density : 0.47

Tapped density : 0.59

Carr’s index : 20.33

Hausner’s ratio : 1.25

**Post Evaluation Results:**

**Table 4.1: Post evaluation results of Metformin HCl Tablets**

S.NO	TEST	OBSERVATION
1	Appearance	Light green color smooth surface
2	Tablet thickness	5mm
3	Tablet diameter	10mm
4	Weight variation	656±4mg
5	Hardness	4kg/m <sup>2</sup>
6	Friability	1.1%
7	Disintegration	45min
8	Dissolution	6hr10min

**Discussion:**

Clinical studies have suggested that *Aloe vera* gel may act as a safe antihyperglycemic for type-II diabetic patients without any significant effects on other normal blood lipid levels or liver/kidney function. [12,13]. *Aloe vera* gel in enhancing glucose transport by modulating the proximal and distal markers involved in glucose uptake and its transformation into glycogen [14,15]. *A. vera* gel has significant antidiabetic and cardioprotective activity as it significantly reduced oxidative stress in streptozocin induced diabetic rats and improved antioxidant status[16] Metformin HCl tablets are prepared using *Aloe vera* powder. Tablets are prepared by direct compression method as the powders pass the pre formulation studies. Prepared tablets are also evaluated and all the results are within the limits. Hence these tablets are tested for its synergistic effect and can be used in the treatment of diabetes with other health benefits.



**Conclusion:**

Metformin HCl formulation was found to be in compliance with all the properties of powders and exhibit satisfactory results. Tablets of good quality fulfilling the official specifications with regard to drug content, hardness, friability and disintegration time could be prepared by direct compression method which can be disintegrated very rapidly. It can be concluded that the formulation of Metformin HCl tablets by using *Aloe-Vera* powder was prepared well and had all the properties.

**References:**

1. <https://www.nhs.uk/conditions/herbal-medicines>
2. Shi Q.W., Li L.G., Huo C.H., Zhang M.L., Wang Y.F. Study on natural medicinal chemistry and new drug development. *Chin. Tradit. Herb. Drugs*. 2010;41:1583–1589.
3. Fabricant D.S., Farnsworth N.R. The Value of Plants Used in Traditional Medicine for Drug Discovery. *Environ. Health Perspect*. 2001;109:69–75.
4. Mathur, M. (2013). Phyto-complex and their role in enhancing efficacy of herbal drugs. *Medicinal Plant*, 5: 118-125.
5. Yuan H, Ma Q, Ye L, Piao G. The traditional medicine and modern medicine from natural products. *Molecules*, 2016; 21(5): 559.
6. Aloe Vera: A Short Review Amar Surjushe, Resham Vasani, And D G Saple, *Indian J Dermatol*. 2008; 53(4): 163–166.
7. M.A. Ajabnoor Effect of aloes on blood glucose levels in normal and alloxan diabetic mice *J Ethnopharmacol*, 28 (1990), pp. 215-220.
8. A. Can, N. Akev, N. Ozsoy, S. Bolkent, B.P. Arda, R. Yanardag, A. Okyar, Effect of *Aloe vera* leaf gel and pulp extracts on the liver in type-II diabetic rat models *Biol Pharm Bull*, 27 (5) (2004), pp. 694-69.
9. R.P. Robertson, Antioxidant drugs for treating beta-cell oxidative stress in type 2 diabetes: glucose-centric versus insulin-centric therapy *Discov Med*, 9 (45) (2010), pp. 132-137.
10. S.B. Thirumalesh Naik, K. Venkateswarlu, K.B. Chandrasekhar, Formulation and in-vitro evaluation of Pregabalin mini tablets for sustained release, *Pharm.Lett.* 8 (2) (2016) 277e283.
11. Dokala GK, Pallavi C. Direct Compression – An Overview. *International Journal of Research in Pharmaceutical and Biomedical Sciences*, January– March 2013; Volume 4 (1): 155-158.
12. Chowdary, Sunil Kumar, And P. Suresh , Preparation, Characterization And Evaluation Of Pgs - Pvp Co-Processed Excipient As Directly Compressible Vehicle In The Formulation Development Of Antiretroviral Drugs, *Ijrpc* 2012, 2(3)]
13. S.B. Thirumalesh Naik, K. Venkateswarlu, K.B. Chandrasekhar, Formulation and in-vitro evaluation of orodispersible tablets of olanzapine for the improvement of dissolution rate, *J. Chem. Pharm. Res.* 8 (1) (2016) 177e181.
14. H.F. Huseini, S. Kianbakht, R. Hajiaghaye, F.H. Dabaghian Anti-hyperglycemic and anti-hypercholesterolemic effects of *Aloe vera* leaf gel in hyperlipidemic type 2 diabetic patients: a randomized double-blind placebo-controlled clinical trial *Planta Med*, 78 (2012), pp. 311-316
15. S. Anand, V.S. Muthusamy, S. Sujatha, *et al.* *Aloe emodin* glycosides stimulates glucose transport and glycogen storage through PI3K dependent mechanism in L6 myotubes and inhibits adipocyte differentiation in 3T3L1 adipocytes *FEBS Lett*, 584 (2010), pp. 3170-3178
16. N. Jain, R. Vijayaraghavan, S.C. Pant, V. Lomash, M. Ali *Aloe vera* gel alleviates cardiotoxicity in streptozocin-Induced diabetes in rats *J Pharm Pharmacol*, 62 (2010), pp. 115-123