

Evaluating Glycemic Control Using Sugarfit's Active Sugar Control Juice: A Retrospective Study

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Abstract: ***Background and Aim:** Effective diabetes management often requires innovative approaches to complement standard treatments. This study investigates the impact of Sugarfit's Active Sugar Control Juice, a plant-based herbal formulation, on fasting blood sugar levels in diabetic individuals. The primary aim is to evaluate its short-term efficacy and explore its potential as a supportive therapy in diabetes care. **Methodology:** A retrospective analysis was conducted on 280 diabetic participants who consumed Sugarfit's Active Sugar Control Juice for 30 days. Fasting blood sugar levels, recorded via the Sugarfit application before and after the intervention, were analyzed. Participants consumed 30 ml of the juice diluted in 200 ml of water daily on an empty stomach, following standardized usage instructions. **Results:** Participants, with an average age of 51.4 ± 11 years, experienced a significant reduction in fasting blood sugar level. The mean fasting blood sugar levels dropped from 149.2 ± 35.1 mg/dL before intervention to 116.34 ± 21.3 mg/dL after 30 days. Within the first 15 days, fasting blood sugar levels dropped by 20.3 ± 22.96 mg/dL, followed by a further reduction of 32.9 ± 25.2 mg/dL by the end of the study, representing an overall average decline of 30%. **Conclusion:** The findings indicate the potential effectiveness Sugarfit's Active Sugar Control Juice's promising short-term effects on lowering fasting blood sugar levels among diabetic individuals. These findings support its use as an adjunct therapy in diabetes management. Further large-scale, long-term clinical studies are essential to confirm its efficacy, identify potential mechanisms, and assess safety over prolonged use.*

Keywords: Diabetes management, herbal medicine, blood sugar control, antidiabetic therapy, retrospective study.

1. Introduction

Self-monitoring of blood glucose (SMBG) is a critical aspect of diabetes management, allowing individuals to track their blood sugar levels and make informed decisions about their treatment and lifestyle (1).

Plant-based products have been widely embraced globally for centuries. In the context of diabetes, certain herbal alternatives have shown promise to alleviate symptoms and prevent secondary complications of the disease. Some herbs have also demonstrated efficacy in regenerating β -cells and overcoming resistance. Alongside regulating blood sugar levels, certain herbs exhibit antioxidant activity and aid in lowering cholesterol. While conventional drugs for type 2 diabetes mellitus focus on reducing blood sugar levels and restoring liver glycogen, no medication within modern medicine possesses both of these properties (2).

Numerous synthetic chemical agents are available for managing and treating diabetes. However, complete recovery from the condition has not yet been reported. In contrast, plants offer a promising source of hypoglycemic compounds and have been extensively used in traditional medicine to prevent diabetes. Many medicinal plants have been researched for their potential benefits in managing different forms of diabetes. These plants may help delay the onset of diabetic complications and address metabolic abnormalities through various mechanisms. A significant number of plants

have undergone clinical trials and demonstrated effectiveness. Additionally, in recent years, several phytoconstituents responsible for antidiabetic effect have been isolated from hypoglycemic plants (3).

The plant-based ingredients utilized in Sugarfit's Active Sugar Control Juice and their roles in reducing blood sugar levels are as follows:

Aloe vera: *Aloe barbadensis miller*, also known as Aloe vera, which exhibits anti-inflammatory effect and has ability to support lipid and carbohydrate metabolism. Research findings indicate that regular consumption of Aloe vera juice for three months led to notable improvements, such as decreased blood sugar levels and enhanced lipid profiles (4,5).

Amla: *Embllica officinalis Gaertn* (Indian gooseberry or amla) contains components like gallic acid, gallotannin, ellagic acid and corilagin, which exhibit anti-diabetic effect, antioxidant effect and free radical scavenging effect. Amla has demonstrated efficacy in preventing or reducing hyperglycemia, as well as mitigating diabetes related complications like cardiac issues, nephropathy, neuropathy, cataractogenesis, and protein wasting (6).

Jamun: *Syzygium cumini Linn.*, commonly known as "Jamun" or black plum, holds a prominent place in traditional Unani medicine for managing diabetes and various other

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ailments. Research indicates that different parts of the Jamun plant exhibit antidiabetic, antioxidant, hypolipidemic, neuropharmacological and free radical scavenging activities, both in vivo and in vitro. Key chemical constituents responsible for its antidiabetic effects include terpenoids, glycosides, saponins, flavonoids, and phenols. It also contains Jambolin, a significant glycoside that inhibits starch conversion into sugar, thereby aiding in blood sugar control (7).

Karela: *Momordica charantia* also known as Karela is a plant-based remedy, has been studied for its effects on blood glucose levels and associated molecular pathways. Compounds like charantin and vicine exhibit hypoglycemic effects by enhancing pancreatic insulin secretion, reducing insulin resistance, promoting glucose utilization in cells, inhibiting intestinal glucose absorption, and suppressing gluconeogenic enzymes (8).

Tulsi: *Ocimum sanctum* Linn commonly known as Tulsi, has been revered in Indian tradition for its potential benefits in managing obesity and diabetes. Tulsi intervention led to reductions in body mass index (BMI), plasma insulin levels, and insulin resistance (9).

Moringa: *Moringa oleifera* Lam commonly used in herbal medicine, has garnered attention for its health-promoting properties, particularly against diabetes mellitus (10). Several studies have reported the antidiabetic effects of *Moringa oleifera*. They indicate that the aqueous extract of *Moringa oleifera* inhibits the activity of α -amylase and α -glucosidase, enhances antioxidant capacity, improves glucose tolerance, and increases the rate of glucose uptake in yeast cells. The aqueous extract shows potential as a phytopharmaceutical for managing diabetes, either as an adjuvant therapy or when used alone (11).

Giloy: *Tinospora cordifolia*, commonly known as 'Giloy,' is frequently used in traditional Indian folk medicine to manage diabetes by regulating blood glucose levels. It possesses antidiabetic properties by reducing oxidative stress, enhancing insulin secretion, and inhibiting gluconeogenesis and glycogenolysis, contributing to blood glucose regulation. Studies have demonstrated that the isoquinoline alkaloid-rich fraction extracted from the stem, containing palmatine, jatrorrhizine, and magnoflorine, exhibits insulin-like and insulin-releasing effects both in vitro and in vivo. Oral consumption of root extracts has been associated with reduced blood glucose levels, increased insulin production, and inhibition of oxidative stress markers it also initiates and restores cellular antioxidant defenses, such as superoxide dismutase (SOD), glutathione peroxidase (GPx), and glutathione (GSH), while inhibiting enzymes involved in glucose metabolism and restoring liver glycogen content (12).

Neem: *Azadirachta indica*, is widely recognized for its medicinal properties. Several studies have confirmed its effectiveness in managing diabetes, hypertension, hyperlipidemia, and obesity. Research indicates that neem can regulate blood sugar levels and blood pressure by increasing the expression of the transcription factor nuclear factor erythroid 2-related factor 2 (Nrf2) and antioxidant effects. Additionally, neem has been found to decrease

glucose uptake by promoting the activity of glucose transporter 4 (GLUT4) and inhibiting key intestinal enzymes such as glucosidases. Its antioxidant properties are crucial in protecting against metabolic syndrome and its associated complications (13).

Bilva: *Aegle marmelos*, commonly known as Bael, originates from India. It has been used to control diabetes in traditional medicinal systems (14). The treatment of leaf extract in diabetic pancreas improved the functionality of pancreatic beta cells, which indicates the hypoglycaemic nature of the leaf extract, helping in the regeneration of the damaged pancreas (15). Additionally, research suggests that the leaf extract of *Aegle marmelos* was found to be as effective as insulin in restoring blood glucose and body weight to normal levels (16).

Indrajav: *Holarrhena pubescens* commonly known as Indrajav is extensively utilized in Indian and Chinese medicinal practices for managing diabetes (17). Its seed extract has been observed to elevate serum insulin levels and lower serum blood glucose levels. Additionally, the extract inhibits intestinal α -glucosidase activity, thereby effectively controlling carbohydrate absorption (18).

Gurmar: *Gymnema Sylvestre* commonly known as 'Gurmar', containing various bioactive compounds like Gymnemic acid and Gymnema saponins, exhibits antidiabetic and antioxidant properties (19). The leaf powder has shown positive effects on blood glucose levels, effectively reducing fasting and postprandial blood glucose levels (20).

Vijaysar: The antidiabetic potential of *Pterocarpus marsupium* Roxb has been previously documented (21). Active constituents extracted from the bark of *P. marsupium* Roxb, particularly epicatechin, a benzopyran, have been found highly effective in stimulating pancreatic islet cells to secrete insulin (22), thereby regulating blood glucose levels.

Kutki: *Picrorhiza kurroa* Royle ex Benth., commonly referred to as Kutki in traditional Ayurvedic medicine, is utilized as a treatment for diabetes in India. It has been observed to notably elevate plasma insulin levels and simultaneously increase the GLUT-4 content in the total membrane fractions of the soleus muscle (23).

This retrospective study aims to evaluate the impact of Sugarfit's Active Sugar Control Juice on fasting blood sugar levels in individuals with diabetes.

2. Methodology

The retrospective analysis focused on users who voluntarily purchased Sugarfit's Active Sugar Control Juice and reported consuming it for 30 days. Their fasting blood sugar levels prior to juice consumption were compared with levels after starting the juice regimen. Participants logged their self-monitoring of blood glucose (SMBG) fasting blood sugar levels using the Sugarfit application.

Intervention:

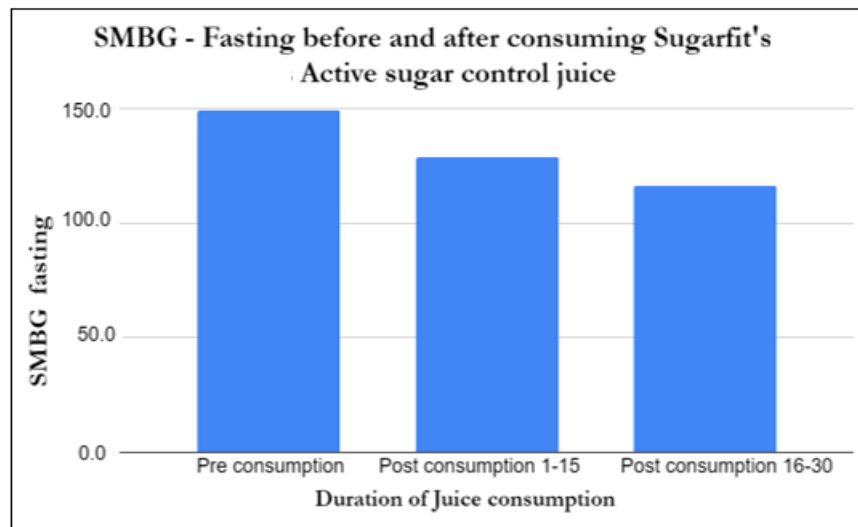
Participants were instructed to consume 30 ml of Sugarfit's Juice diluted in 200 ml of water on an empty stomach. These

explicit guidelines were provided in the product description section on the juice mono carton.

3. Results

A total of 280 individuals with diabetes met the inclusion criteria and were included in the retrospective analysis. The mean age of the participants was 51.4 ± 11 years, with 248

males and 82 females. The study revealed a significant reduction in fasting blood sugar levels after consuming Sugarfit's Active Sugar Control Juice. Prior to consumption, the average fasting blood sugar level among participants was 149.2 ± 35.1 mg/dL. The average fasting blood sugar levels in the first 15 days decreased to 128.9 ± 24.7 mg/dL and in 30 days it was reduced to 116.34 ± 21.3 mg/dL, indicating a reduction of 20.3 ± 22.96 mg/dL in the first 15 days and 32.9 ± 25.2 mg/dL reduction in 30 days after consuming juice.



4. Discussion and Conclusion

The observed reduction in fasting blood sugar levels after consuming Sugarfit's Active Sugar Control Juice underscores the potential efficacy of this juice in managing blood sugar levels among individuals with diabetes. An average of 30% reduction in fasting blood sugar levels was observed within a short span of 15 days and was maintained until 30 days. This finding aligns with a study suggesting the potential benefits of traditional herbal medicinal systems for the successful treatment of diabetes and has great potential as a valuable alternative for antidiabetic therapies (24). The primary advantage of the intervention lies in its potential to decrease HbA1c levels, thereby potentially enabling a reduction in the required doses of existing oral hypoglycemic agents through consistent usage. The ingredients present in Sugarfit's juice formulation may have played a crucial role in mediating this effect by potentially improving insulin sensitivity, enhancing glucose uptake, or regulating glucose metabolism. Certain herbal constituents in the juice, such as *Gymnema sylvestre* or *Picrorhiza kurroa*, have been associated with glucose-lowering effects (25, 26).

While these results are promising, it is imperative to recognize the need for further investigation. Studies exploring the specific pathways through which the Sugarfit's Active Sugar Control Juice exerts its effects on blood sugar levels are essential. Additionally, long-term clinical trials with larger sample sizes and extended follow-up periods are warranted to evaluate the efficacy of the product. Furthermore, it is essential to consider potential confounding factors and to explore any adverse effects associated with prolonged consumption of the juice.

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