



Exploring the Chemical Diversity of Qurs-E-Ziabetus Sada: A Stride Towards Analytical and Biological Validation

AWADHESH KUMAR^{1,3}, AKASH VED², IRFAN AZIZ¹, SYED MISBAHUL HASAN¹,
PUSHPENDRA SONI¹ and SHOM PRAKASH KUSHWAHA^{1*}

¹Faculty of Pharmacy, Integral University, Dasauli, Kursi Road, Lucknow, Uttar Pradesh, 226026, India.

²Faculty of Pharmacy, Dr. APJ Abdul Kalam Technical University, Sector 11, Jankipuram Vistar,
Lucknow, 226031, India.

³Goel Institute of Pharmaceutical Sciences, Faizabad Road, Lucknow, 226028, India.

*Corresponding author E-mail: shompk@iul.ac.in

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ABSTRACT

Qurs-E-Ziabetus Sada, a renowned traditional Unani formulation, has been extensively used for managing diabetes mellitus. This paper delves into the chemical diversity of its bioactive constituents and explores their potential roles in modulating key signaling pathways such as PI3K-Akt, AMPK, and MAPK, which are pivotal in glucose metabolism and insulin sensitivity. The formulation's hypoglycemic effects are attributed to the synergistic action of its herbal and mineral components. However, the absence of comprehensive chemical profiling and biological validation limits its integration into evidence-based medicine. This study underscores the necessity of rigorous analytical validation, employing advanced techniques and well-designed trials to confirm the formulation's chemical complexity and therapeutic efficacy. Furthermore, the paper advocates for standardization protocols to ensure the safety, efficacy, and reproducibility of Unani formulations, highlighting their potential for global acceptance and integration into modern healthcare systems.

Keywords: Chemical diversity, Diabetes mellitus, Herbal formulation, Hyphenated

INTRODUCTION

Diabetes mellitus has long been treated with Qurs-E-Ziabetus Sada, a traditional Unani medication. It is a traditional herbal formulation commonly used for managing diabetes, particularly in regions where traditional medicine is a prevalent part of healthcare. Herbal remedies like Qurs-E-Ziabetus Sada are valued for their perceived efficacy in controlling blood sugar levels and supporting overall diabetic health.

It combines mineral and floral elements to create a vast chemical variety that may have therapeutic uses. However, its incorporation into contemporary medicine has been impeded by the absence of thorough chemical profiling and biological confirmation. To comprehend the formulation's pharmacological activities and guarantee its safety and effectiveness, it is essential to investigate its chemical diversity. This work intends to close the gap between conventional wisdom and contemporary scientific confirmation by



utilising sophisticated analytical methods such as hyphenated mass spectrometry, opening the door for standardisation and international recognition of this age-old cure.

South Asia, particularly India, is experiencing a significant increase in diabetes prevalence. The region is home to over 72 million adults with diabetes, expected to exceed 123 million by 2035¹. The integration of Unani medicine into national health programs, such as the NPCDCS-AYUSH project in India, has shown promising results in screening and managing non-communicable diseases (NCDs)². The World Health Organization recognized Unani medicine which offers promising formulations for managing diabetes mellitus, a leading global health concern.

Qurs-E-Ziabetus-Sada

As per National Formulary of Unani Medicine, Part VI, published by Government of

India, Ministry of AYUSH Qurs-E-Ziabetus-Sada contains ingredients known for their hypoglycemic properties, helping to regulate blood sugar levels. The formulation is composed of various herbal ingredients believed to improve insulin sensitivity and regulate glucose metabolism, making it popular in regions where traditional medicine is prevalent. The manufacturing process involves cleaning, grinding and sieving these herbs (Table 1), followed by mixing and tablet formation with a binding agent. The tablets are then dried and packaged under controlled conditions to ensure product stability and efficacy³. According to most commonly cited sources in scholarly texts in various national and international research papers Qurs-E-Ziabetus Sada is composed of several herbs, each of these herbs contains bioactive compounds that contribute to its anti-diabetic effects. We have considered the constituents from these sources for the purpose of this review.

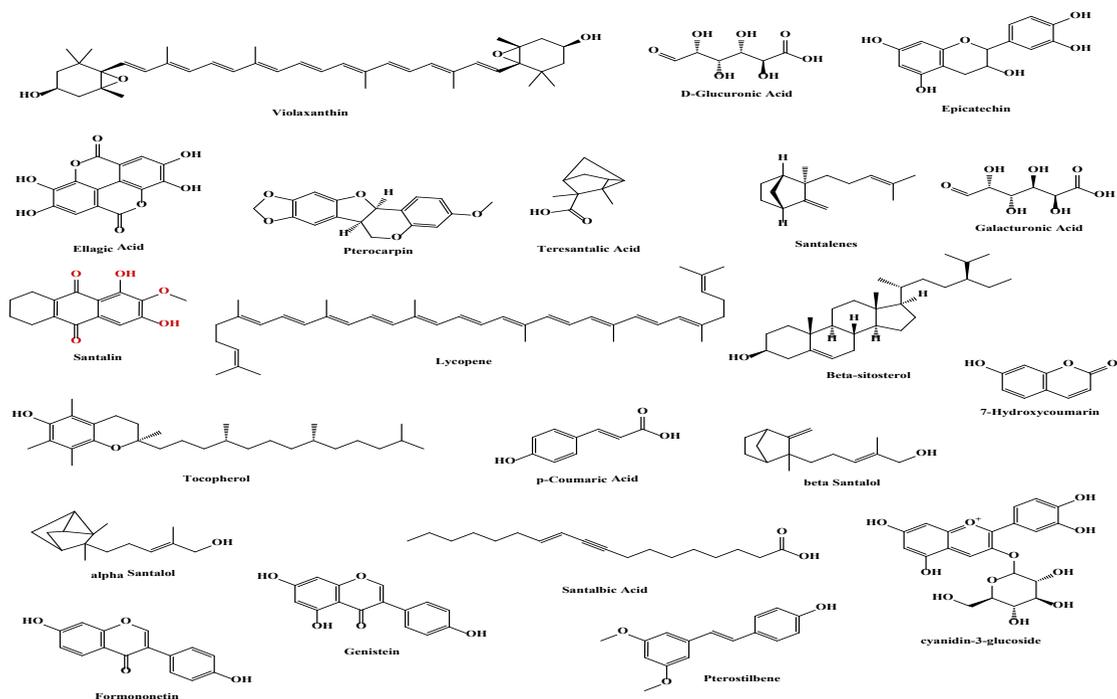
Table 1: Active Components in Qurs-E-Ziabetus Sada

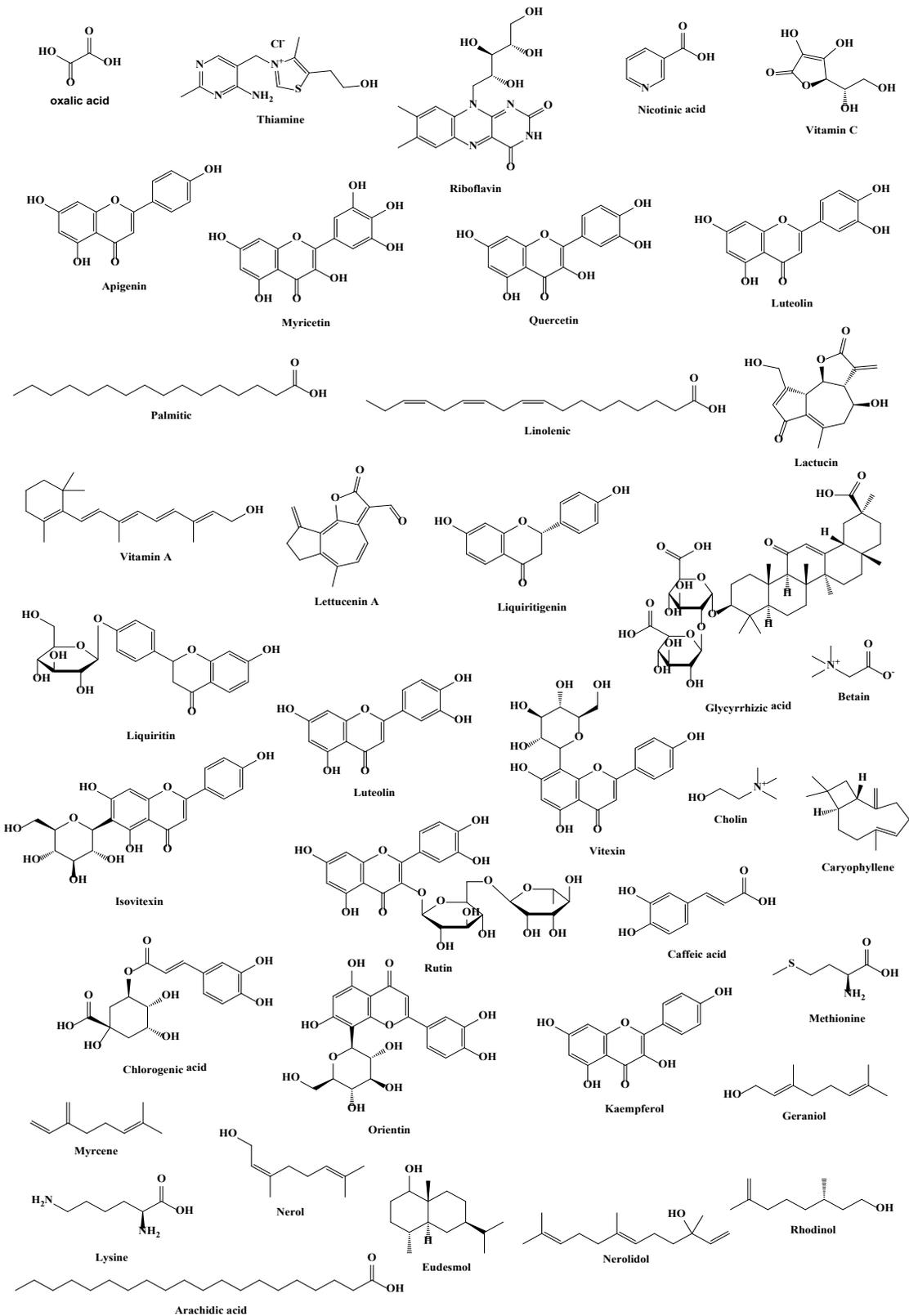
Sr. No	Unani name	Botanical name	Active Constituents
1	Tukhm-e-Khurfa	<i>Portulaca oleracea</i> The aqueous extract of <i>Portulaca oleracea</i> also prevents diabetic vascular inflammation, hyperglycemia, and diabetic endothelial dysfunction in type II diabetic db/db mice. ⁴	Oleraceins, Kaempferol, α -linolenic acid, Polysaccharides
2	Tukhm-e-Kahu	<i>Lactuca sativa</i> Lactucaxanthin from lettuce inhibits α -amylase and α -glucosidase activities, reducing post-prandial hyperglycemia in diabetic rats. ⁵	Lactucaxanthin, Chlorogenic acid, Dietary Fiber
3	Rubb-us-Soos	<i>Glycyrrhiza glabra</i> Licorice and its metabolites show significant therapeutic potential for treating diabetes mellitus. These compounds enhance insulin sensitivity, improve glucose utilization, reduce oxidative stress, and target multiple signaling pathways like PI3K/Akt, AMPK, NF-B, and AGE-RAGE. ⁶	Polysaccharides, AmorfrutinsI, soliquiritigenin
4	Tabasheer	<i>Bambusa arundinacea</i> <i>Bambusa arundinacea</i> -mediated ZnO nanoparticles exhibit significant anti-hyperglycemic, antimicrobial, and anticancer activities, highlighting their pharmaceutical potential. ⁷	Silica, Flavonoids, phenolic acids
5	Gil-e-Armani	<i>Bole Armeniac</i> <i>Burah Armani</i> Bole's potential as an effective anti-diabetic agent in Unani medicine, showcasing its pharmacological properties and benefits for managing diabetes-related complications. ⁸	Iron oxide
6	Gul-e-Surkh	<i>Rosa damascena</i> The methanol extract of <i>Rosa damascena</i> flowers effectively inhibits α -glucosidase activity and postprandial hyperglycemia in normal and diabetic rats, suggesting potential anti-diabetic applications. ⁹	Anthocyanins, citronellol, flavonoids
7	Kishnsez Khusk	<i>Coriandrum sativum</i>	Fatty acids, Polyphenols

		The methanol extract of <i>Rosa damascena</i> flowers inhibits α -glucosidase and reduces postprandial hyperglycemia, demonstrating potential for managing diabetes by controlling carbohydrate absorption. ¹⁰	Vitamin C
8	Aquaquia	<i>Acacia arabica</i> <i>Acacia arabica</i> bark extract improves insulin secretion and glucose metabolism, reduces DPP-IV enzyme activity, and enhances GLP-1 levels, supporting its antidiabetic potential. ¹¹	Leucine Flavonoids Alkaloids
9	Samgh-e-Arabi	<i>Acacia senegal</i> Gum acacia significantly improves glucose tolerance and reduces insulin levels in healthy individuals, indicating its potential role in managing postprandial blood sugar and insulin responses. ¹²	Polysaccharides Glycoproteins Uronic acids
10	Sandal Safaid	<i>Santalum album</i> <i>Santalum album</i> effectively improves the lipid profile in diabetic rats. ¹³	Santalene Santyl acetate
11	Sandal Surkh	<i>Pterocarpus santalinus</i> Santalinus has many flavonoids and polyphenols that exert their anti-diabetic effects via anti-inflammatory and antioxidant pathways. ¹⁴	Pterocarpol Pterosupin Kaempferol
12	Gulnar	<i>Punica granatum</i> Positive effects in ameliorating blood glucose homeostasis. ¹⁵	Cyanidin Gallic acid
13	Kafoor	<i>Cinnamomum camphora</i> Camphora leaves may have potential beneficial effects for the treatment of diabetes mellitus. ¹⁶	Cinnamaldehyde Safranal Borneol

Qurs-E-Ziabetus Sada exhibits a enormous chemical diversity (Fig. 1). Thymoquinone, has been shown to enhance insulin sensitivity and reduce oxidative stress in diabetic models. It acts through the activation of the peroxisome proliferator activated receptor gamma pathway, which plays a crucial role in glucose metabolism¹⁷. The alkaloid trigonelline has demonstrated insulinotropic effects, enhancing insulin secretion from pancreatic cells¹⁸.

Cinnamaldehyde improves insulin sensitivity by increasing glucose uptake in peripheral tissues and enhancing the activity of insulin receptor kinase¹⁹. Charantin, polypeptide-P, and vicine exhibit hypoglycemic effects by mimicking insulin activity and promoting glucose uptake in skeletal muscle and adipose tissue. It also upregulates GLUT4 (Glucose Transporter Type 4) expression, facilitating glucose transport into cells²⁰.





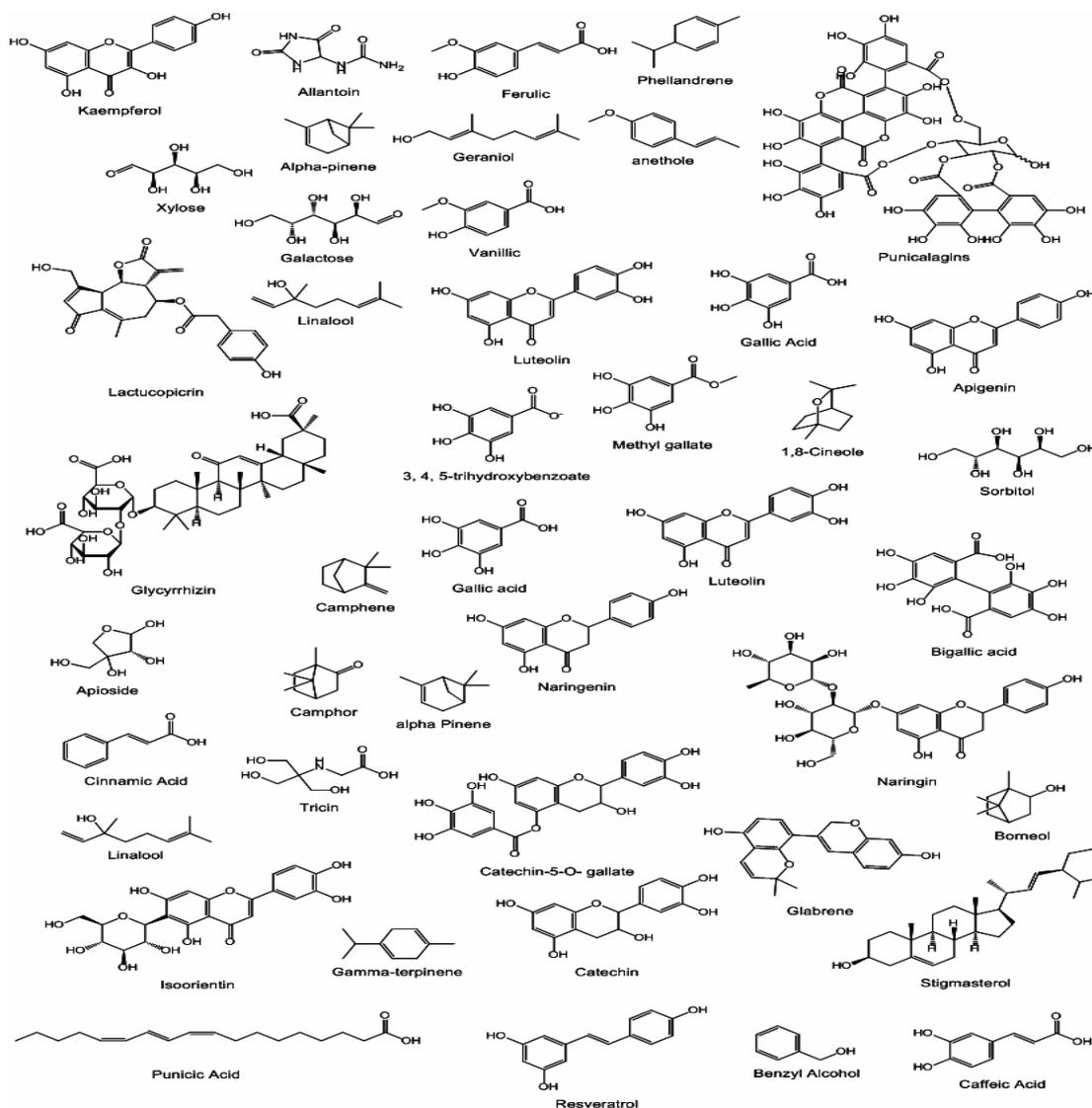


Fig. 1. Chemical diversity in Qurs-E-Ziabetus Sada

The active components of Qurs-E-Ziabetus Sada modulate several key signaling pathways, including the PI3K-Akt, AMPK, and MAPK pathways. These pathways are crucial for maintaining glucose homeostasis, enhancing insulin sensitivity and mitigating cellular stress responses. The modulation of these pathways by the herbal constituents of Qurs-E-Ziabetus Sada underpins its therapeutic efficacy in managing diabetes and its associated complications and may be used to the development of enhanced therapeutic benefits²¹⁻²⁴.

DISCUSSION

Chemical and scientific validation

of Unani treatments may elevate their status within global healthcare systems. Moreover, there is a pressing need for rigorous research. High-quality, well-designed studies are essential to ensure the chemical validation, safety, efficacy and reproducibility of Unani treatments. Such research will provide the necessary evidence to validate traditional uses of these formulations, thereby increasing their acceptance and integration into mainstream healthcare. Exploration of Active Components interactions maybe executed conducting a detailed phytochemical analysis of these components, understanding their chemical structures and biological interactions.

CONCLUSION

The integration of Unani treatments like Qurs-E-Ziabetes Sada into global healthcare systems requires robust chemical and scientific validation. Rigorous, high-quality research is essential to establish their safety, efficacy, and reproducibility. Conducting well-designed studies and comprehensive phytochemical analyses can unveil the active components, elucidate their chemical structures, and map their biological interactions. Such efforts will provide the scientific evidence needed to validate traditional uses, fostering trust and acceptance among the global medical community. By bridging traditional wisdom with modern analytical approaches, this research paves the way for the standardization and

integration of Unani formulations into evidence-based healthcare systems.

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Conflict of interest

The author declare that we have no conflict of interest.

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