Diabetes Asia Journal
Vol. 2, Issue 2, July 2025, Edition: Online
Publisher: Diabetes Asia Journal under JHRC
eISSN: 3048-8192
Cross Ref DOI: https://doi.org/10.62996/daj.56042025
Journal Homepage: https://diabetesasia.org/journal/

Research Article

The effect of dog rose fruit on blood glucose and lipids in the rabbits

Taherah Mohammadabadi[1*]

Submitted: 1 July 2025; Accepted: 20 July 2025; Published: 20 July 2025

[1*] Professor, Faculty of Animal Science and Food Technology, Agricultural Sciences and Natural Resources University, Iran. Email: t.mohammadabadi.t@gmail.com

Corresponding Author: [1]*Professor, Faculty of Animal Science and Food Technology, Agricultural Sciences and Natural Resources University, Iran. email: mohammadabadi@asnrukh.ac.ir

Key Words: Dog Rose Fruit, Blood Glucose, Lipids, Triglyceride

Abstract
The current study was conducted to study the effects of dog rose fruit on blood sugar and fat in New Zealand rabbit. The 30 New Zealand rabbits were fed control diet, 15 % and 25% dog rose in a completely random design. At the end of the experimental, blood samples were taken from the rabbits' hearts and glucose, cholesterol, triglycerides, LDL, and HDL was determined. 25% dog rose decreased the concentration of cholesterol, triglyceride, LDL, HDL, and glucose compared to the control treatment ($p<0.05$). According to the results of this research, dog rose fruit can reduce blood glucose and blood fat.

Keyword: Blood sugar, blood fat, dog rose fruit, rabbit.

Introduction

Diabetes is an endocrine disorder that is characterized by an increase in blood glucose levels due to insufficient insulin secretion, insulin resistance, or both. The use of chemical drugs, apart from their beneficial effects, has many side effects. From this perspective, herbal medicines for diabetes treatment have fewer side effects [1]. Additionally, hyperlipidaemia, an unhealthy diet, physical inactivity, diabetes, and hypertension are significant risk factors for cardiovascular diseases [2]. Plants remain a valuable source of therapeutic agents, especially against certain types of chronic diseases [3]. In modern medicine, global attention has been directed to these types of plants due to their safety [4]. In addition, in most cases, the use of medicinal plants can help control secondary complications caused by diabetes. Long-term use of these plants can also affect the concentration of glucose and lipids in the blood, as well as body fat [5].

Dog rose or Rosa canina L is a perennial plant in the form of an erect or wide shrub [6]. The fruits of rose have been used in herbal remedies since ancient times. They are rich in biologically active substances such as antioxidant compounds vitamins C, B1, B2, P, K, vitamin E, carotene, lycopene, pectin, flavonoids (kaempferol, quercetin, rutin), anthocyanin with high antioxidant activity [7]. The results of several studies have shown that dog rose possesses anti-inflammatory, anti-cancer, antimicrobial, and antioxidant properties [8]. It is reported that saponin present in plants has anti-diabetic properties, increases glycogen accumulation, and reduces triacylglycerol storage in the liver [9]. This effect may suggest the beneficial effects of many traditional medicinal

plants used in the treatment of diabetes and obesity. The current study was conducted to investigate the effects of dog rose on blood sugar and fat in New Zealand rabbit.

Materials and methods

Twenty New Zealand rabbits with an average weight of 250 g and 1.5 months age were used. The diet of the rabbits was adjusted based on weight and according to the rabbit nutrient requirements. 30 Rabbits were fed a control diet(10 rabbits); 15 %(10 rabbits) and 25% (10 Rabbits) dog rose fruit in a completely random design for 30 days. The daily feed was provided to the rabbits in morning and afternoon.

At the end of the experimental period, 30 rabbits were randomly selected from each treatment, and blood was taken from their hearts. Blood samples were collected in 10 ml tubes containing 10% EDTA and immediately transferred to the laboratory. Then, blood samples were centrifuged (3000 rpm, 10 minutes) and plasma stored at -20 degrees Celsius. Analysis of blood plasma (glucose, cholesterol, liver enzymes, triglycerides, LDL, and HDL) was performed using Hitachi 902 machine.

The analysis of the results was done using the statistical software SAS version 9.4 in the form of a completely randomized design and using the GLM procedure. The statistical model of the design was as following: $Yij=\mu+Tj+\varepsilon ij$

Results and discussion

The effect of dog rose on blood biochemical parameters are shown in Table 1. Dog rose fruit significantly reduced the amount of blood cholesterol, triglyceride, LDL, HDL, and glucose ($P<0.05$).

Table 1. The effect of dog rose on the blood glucose and lipids of rabbits (mg/dL)

Parameters	**Control n_1 (10)**	**15% dog rose n_2 (10)**	**25% dog rose n_3 (10)**	SEM	P-value
Glucose	141.0^a	126.5^b	114.5^c	0.2	0.001
LDL	19.5^a	14.5^b	13.5^b	0.4	0.01
HDL	15.5^b	21.5^a	23.5^a	0.8	0.03
Cholesterol	91.0^a	79.1^b	69.2^c	0.3	0.02
Triglycerides	131.5^a	119.5^b	105.5^c	0.2	0.002

Different letters in each row indicate a significant difference ($P<0.05$).

Studies showed that one of the most important symptoms of diabetes is inflammation and oxidative damage that will involve liver and pancreas tissues. Therefore, natural compounds with anti-inflammatory and antioxidant properties can reduce diabetes complications. Natural compounds can be used to treat diseases without causing side effects. Additionally, plants are enriched with alpha-glucosidase inhibitors, demonstrating their anti-diabetic potential by improving physiological conditions [10]. Among the many medicinal plants that have beneficial effects on diabetes, the presence of two substances, beta-carotene and saponin, is having a significant impact [11]. Based on their structural features, it appears that these two substances may be beneficial in alleviating the symptoms of diabetes. Today, the trend in diabetes treatment is to control blood glucose and reduce the complications caused by oxidative stress [12]

The results of this research showed that dog rose reduced glucose, triglyceride, cholesterol, LDL, and HDL in the tested rabbits. In agreement with this research, the results of a study showed that the consumption of dog rose extract decreased the serum concentration of total cholesterol, triglycerides, and LDL in diabetic rats [13]. The results of another study also showed that supplementing dog rose extract improved glucose tolerance and increased insulin secretion in genetically diabetic mice at the pre-diabetic stage [14]. The flavonoids and organic acids in dog rose prevent the oxidation of vitamin C, which increases its stability and bioavailability [15]. It has been seen that vitamin C reduces the activity of the aldose reductase enzyme, which increases due to the accumulation of sorbitol in the eyes, nerves, and kidneys in diabetes. [11] showed that dog rose contains volatile

phenolic and antioxidant compounds. Dog rose contains unsaturated fatty acids, such as linolenic acid and linoleic acid [16].

Based on the findings obtained in this research, the use of dog rose fruit as a medicinal plant was able to reduce serum cholesterol, triglyceride, LDL, and glucose favourably. Nevertheless, it maybe suggested on healthy, diabetic and obesity people.

References

1. Talebian poor, M. S., Talebianpoor, M. S., Mansourian, M., & Vafaiee-Nejad, T. Antidiabetic Activity of Hydroalcoholic Extract of Myrtus communis (Myrtle) Fruits in Streptozotocin-Induced and dexamethasone-Induced Diabetic Rats. Pharmacognosy Research.2019;*11*(2):115-120. DOI:10.4103/pr.pr_160_18
2. Dhungana RR, Thapa P, Devkota S, Banik PC, Gurung Y, Mumu SJ, Shayami A, Ali L. Prevalence of cardiovascular disease risk factors: A community-based cross-sectional study in a peri-urban community of Kathmandu, Nepal. Indian Heart J. 2018 Dec;70 Suppl 3(Suppl 3): S20-S27. doi: 10.1016/j.ihj.2018.03.003
3. Das, T. K., Banerjee, D., Chakraborty, D., Pakhira, M. C., Shrivastava, B., & Kuhad, R. C. (2012). Saponin: role in animal system. Veterinary World.2012; *5*(4):248-254. 10.5455/vetworld.2012.248-254
4. Saad B, Kmail A, Haq SZH. Anti-Diabesity Middle Eastern Medicinal Plants and Their Action Mechanisms. Evid Based Complement Alternat Med. 2022 Jul 18; 2022:2276094. doi: 10.1155/2022/2276094
5. Chaudhury A, Duvoor C, Reddy Dendi VS, Kraleti S, Chada A, Ravilla R, Marco A, Shekhawat NS, Montales MT, Kuriakose K, Sasapu A, Beebe A, Patil N, Musham CK, Lohani GP, Mirza W. Clinical Review of Antidiabetic Drugs: Implications for Type 2 Diabetes Mellitus Management. Front Endocrinol (Lausanne). 2017 Jan 24; 8:6. doi: 10.3389/fendo.2017.00006
6. Javanmard, M., Asadi-Gharneh, H. A. Study of quantitative and qualitative traits of fatty acids in dog rose (Rosa canina L.) ecotypes from Isfahan region of Iran. *Iranian Journal of Horticultural Science*. 2016; 47(3): 595-606. doi: 10.22059/ijhs.2016.59821
7. Vlaicu, A. P., Turcu, R. P., & Panaite, D. T. Rosehip (Rosa canina) as a Beneficial Dietary Feed in Poultry Nutrition. Advanced Research in Life Sciences. 2020; *4*(1), 11-15. https://doi.org/10.2478/arls-2020-0012
8. Koczka N, Stefanovits-Bányai É, Ombódi A. Total Polyphenol Content and Antioxidant Capacity of Rosehips of Some *Rosa* Species. Medicines (Basel). 2018 Aug 4;5(3):84. doi: 10.3390/medicines5030084
9. Aba, P. E., & Asuzu, I. U. Mechanisms of actions of some bioactive anti-diabetic principles from phytochemicals of medicinal plants: A review. Indian Journal of Natural Products and Resources (IJNPR) [Formerly Natural Product Radiance (NPR)], 2018;*9*(2): 85-96. 10.56042/ijnpr. v9i2.18388
10. Raza SA, Chaudhary AR, Mumtaz MW, Ghaffar A, Adnan A, Waheed A. Antihyperglycemic effect of Conocarpus erectus leaf extract in alloxan-induced diabetic mice. Pak J Pharm Sci. 2018 Mar;31(2(Suppl.)):637-642. https://pubmed.ncbi.nlm.nih.gov/29625935/
11. Demir, N., Yildiz, O. K. T. A. Y., Alpaslan, M., & Hayaloglu, A. A. Evaluation of volatiles, phenolic compounds and antioxidant activities of rose hip (Rosa L.) fruits in Turkey. *Lwt-food science and technology*, 2014;*57*(1):126-133. 10.1016/j.lwt.2013.12.038
12. Jabalbarezi Hukerdi Y, Fathi Nasri MH, Rashidi L, Ganjkhanlou M, Emami A. Effects of dietary olive leaves on performance, carcass traits, meat stability and antioxidant status of fattening Mahabadi male kids. Meat Sci. 2019 Jul; 153:2-8. doi: 10.1016/j.meatsci.2019.03.002

13. Sadigh-Eteghad, S., Rahimi, F., Mahmoudi, J., Baradaran, L. Effects of Rosa canina fruit hydroalcoholic extract on lipid profile and liver enzymes level in diabetic mice. Cell and Tissue Journal. 2019; 10(1): 34-41. doi: 10.52547/JCT.10.1.34
14. Chen SJ, Aikawa C, Yoshida R, Kawaguchi T, Matsui T. Anti-prediabetic effect of rose hip (Rosa canina) extract in spontaneously diabetic Torii rats. J Sci Food Agric. 2017 Sep;97(12):3923-3928. doi: 10.1002/jsfa.8254
15. Jemaa HB, Jemia AB, Khlifi S, Ahmed HB, Slama FB, Benzarti A, Elati J, Aouidet A. ANTIOXIDANT ACTIVITY AND A-AMYLASE INHIBITORY POTENTIAL OF ROSA CANINA L. Afr J Tradit Complement Altern Med. 2017 Jan 13;14(2):1-8. doi: 10.21010/ajtcam. v14i2
16. Moaveni, P. (2009). Medicinal plants. Shahr Ghods University Publ PP.707-710, (In Persian).

Ethical Considerations: The research strictly adhered to the principles set forth in the Declaration of Helsinki, demonstrating our unwavering commitment to ethical standards.

Conflicts of Interest and Funding: The authors reaffirm their absolute lack of conflicts of interest. Author confirm there are no financial relationships with any organizations that could be seen as having an interest in this work, both currently and within the past three years. Importantly, no funding was received from any source, institution, or pharmaceutical agency for this study or its publication.

Human Rights Declaration: Author affirm their strong commitment to the UN's Declaration of Human Rights, positioning it as a guiding principle for this manuscript submission. This research reinforces that commitment, emphasizing clear and steadfast dedication to ethical research practices.

- **Funding: Not received.**
- **Informed Consent** N/A
- **Conflict of Interest Statement**

  The author declared “No Conflict of Interest” with this publication.

- **DOI:** https://doi.org/10.62996/daj.56042025

Cite this Article:

Taherah Mohammadabadi. The effect of dog rose fruit on blood glucose and lipids in the rabbits. Diabetes Asia Journal; 2(2): 29-32. https://doi.org/10.62996/daj.56042025